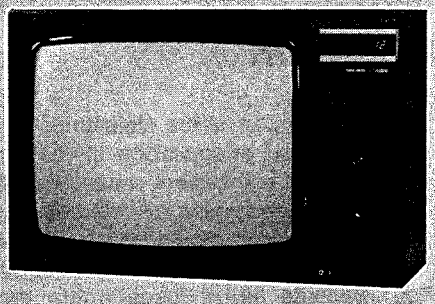
SERVICE DATA
(SUPPLEMENT)
FILE NO. 023-734

TOSHIBA

TELETEXT COLOUR TELEVISION

201T4B:201T4BA
221T4B



MODELS 201T4B
201T4BA

MODEL 221T4B

For Alignment Procedure and Troubleshooting, see the service data for 201E4B:221E4B (File No. 020-732).

SPECIFICATIONS

INPUT POWER RATING:	77 watts (nominal), AC 240 volts, 50Hz
AERIAL INPUT IMPEDANCE:	75 ohm unbalanced type UHF
RECEIVING CHANNELS:	Any of UHF channels ..... channels 21 to 68
INTERMEDIATE FREQUENCIES:	Picture I-F carrier frequency ..... 39.5 MHz
	Sound I-F carrier frequency ..... 33.5 MHz
	Color sub-carrier frequency ..... 35.07 MHz
CHASSIS CONSTRUCTION:	IC Solid State Horizontal Chassis
PICTURE TUBE:	201T4B: 510ABUB22-TC01(PY) 48 cm (measured on diagonal of viewable-picture area) 90° Deflection
	201T4BA: A51-590X 48 cm (measured on diagonal of viewable-picture area) 90° Deflection
	221T4B: 560DYB22-TC03(PYD) 53 cm (measured on diagonal of viewable-picture area) 90° Deflection
SOUND OUTPUT:	3 watts (at 10% harmonic distortion), Max. 4.2 watts
SPEAKER:	10 cm round (Woofer), 5 cm round (Tweeter)
DIMENSION:	Height ..... 425 mm (201T4B, 201T4BA) / 497 mm (221R4B)
	Width ..... 619 mm (201T4B, 201T4BA) / 657 mm (221R4B)
	Depth ..... 472 mm (201T4B, 201T4BA) / 481 mm (221R4B)
WEIGHT (NET):	201T4B & 201T4BA: 23.5 kg, 221T4B: 27.5 kg

Aug. 1984 Printed in Japan

SAFETY INSTRUCTION

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" BELOW.

X-RAY RADIATION PRECAUTION

1. The E.H.T. must be checked every time the receiver is serviced to ensure that the C.R.T. does not emit X-ray radiation as a result of excessive E.H.T. voltage. The nominal E.H.T. for these receivers is 24.5k V at zero beam current (minimum brightness) operating at 240 V a.c. The maximum E.H.T. voltage permissible in any operating circumstances must not exceed 26.5k V. When checking the E.H.T., use the 'High Voltage Check' procedure on page 3 of the service data for models 201E4B: 221E4B using an accurate E.H.T. voltmeter.
2. The only source of X-ray radiation in this receiver is the C.R.T. To prevent X-ray radiation occuring when changing a faulty C.R.T., the replacement C.R.T. must be identical to the original fitted as specified in the Parts List.
3. Some components used in this receiver have safety related characteristics preventing the C.R.T. emitting X-ray radiation.
   For continued safety, component replacement should only be made after referring to the Product Safety Notice below.

SAFETY PRECAUTION

1. This receiver has a nominal working E.H.T. voltage of 23k V.
   Extreme caution should be exercised when working on the receiver with the back removed.
   Do not attempt to service this receiver if you are not conversant with the precautions and procedures for working on high voltage equipment
   When handling or working on the C.R.T., always discharge the anode to the receiver chassis before removing the anode cap.
   The C.R.T., if broken, will violently expel glass fragments. Use shatter proof goggles and take extreme care while handling.
   Do not hold the C.R.T. by the neck as this is a very dangerous practice.
2. A small part of the chassis used in receiver is, when operating, at approximately half mains potential at all times. It is therefore essential in the interest of safety that when servicing or connecting any test equipment the receiver should be supplied via a suitable isolating transformer of adequate rating.
3. Replace blown fuses within the receiver with the fuse specified in the parts list.
4. When replacing wires or components to terminals or tags, wind the leads around the terminal before soldering. When replacing safety components identified by shading on the circuit diagram and parts list, it must be a Toshiba approved type and must be mounted as the original.
5. Keep wires away from high voltage or high temperature components.

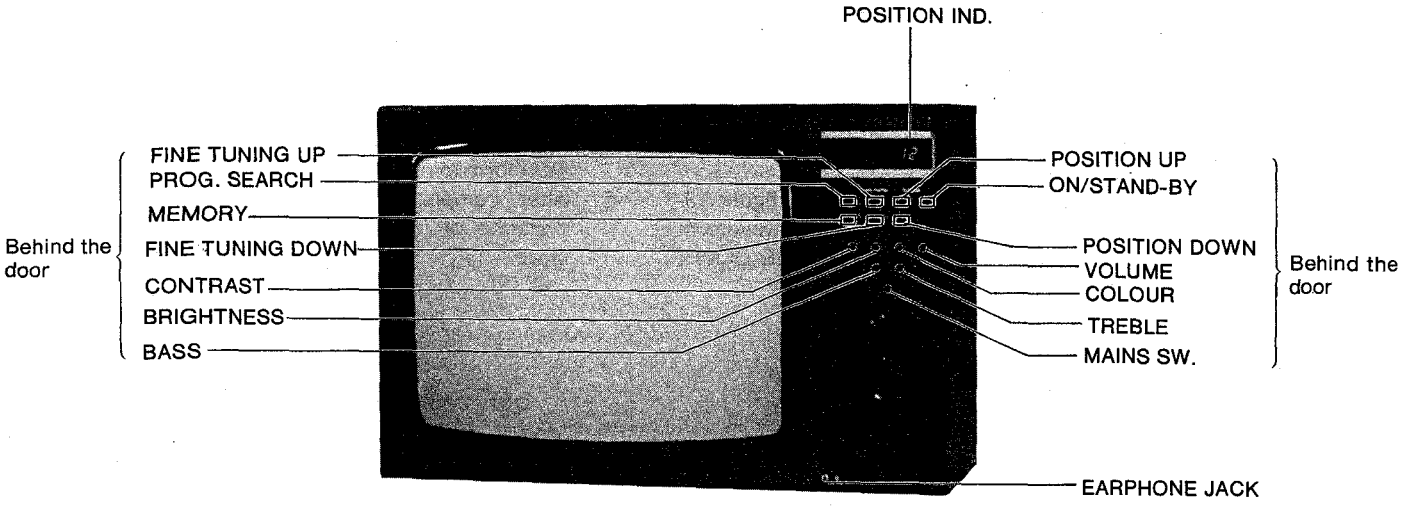
PRODUCT SAFETY NOTICE

Many electrical and mechanical components in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-ray radiation protection afforded by them cannot necessarily be obtained by using replacement components rated at high voltages or wattages, etc. Components which have these special safety characteristics in this manual and its supplements are identified by shading on the schematic diagram and parts list. Before replacing any of these components, read the parts list in this manual carefully. Substitute replacement components which do not have the same safety characteristics as specified in the parts list may create X-ray radiation.

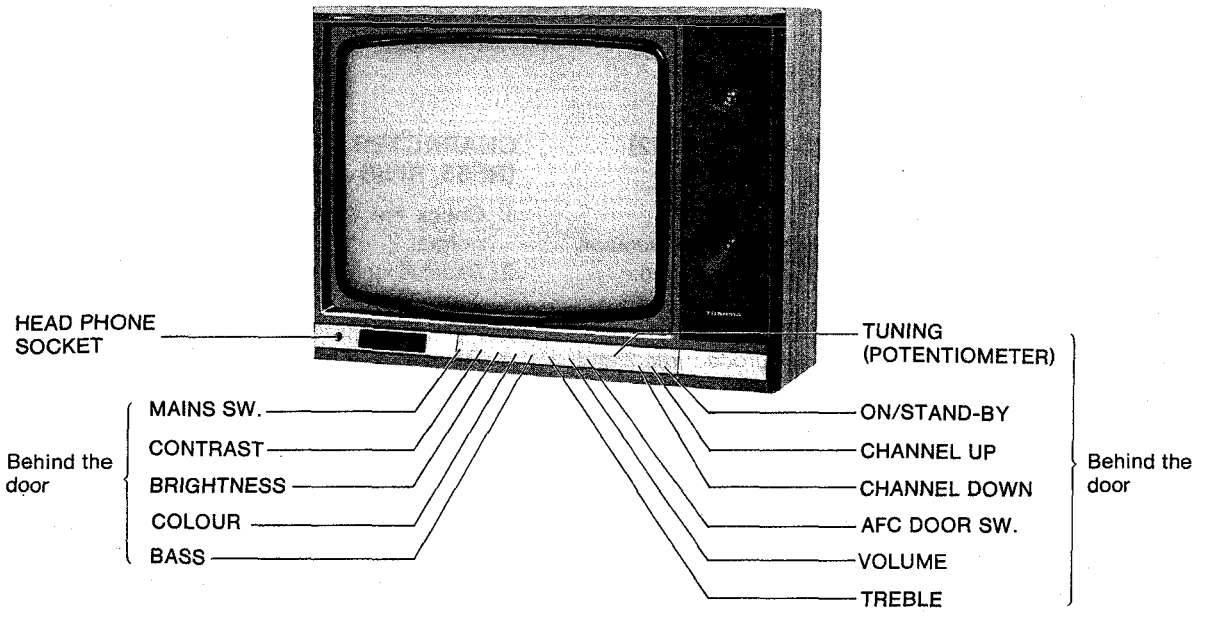
CAUTION: CHASSIS LIVE IRRESPECTIVE OF MAINS POLARITY.

FRONT CONTROLS VIEW

MODELS 201T4B:201T4BA



MODEL 221T4B



INFRARED SENSOR AMP ALIGNMENT
(Remote Control Receiver)

TUNING FREQUENCY ADJUSTMENT

When LK01 or CK01 is replaced, readjustment is required.
During adjustment, keep the VOLUME DOWN Button on the remote control hand unit pressed.

1. Turn the TV set on.
2. Connect an oscilloscope across CK01. (See figure 1.)
3. Adjust LK01 for the maximum amplitude of waveform (See figure 2) while holding down VOLUME DOWN Button on the hand unit.
4. Rotate the core of LK01 for the maximum amplitude of waveform on the scope, clockwise from the fully counterclockwise position. (See figure 2.)
   Note: While adjustment, face the remote hand unit to such direction as to keep 1 Vp-p amplitude of waveform to prevent the saturation of response.
5. After completing adjustment, check the effective distance of the hand unit for approx. 5 meters or more.

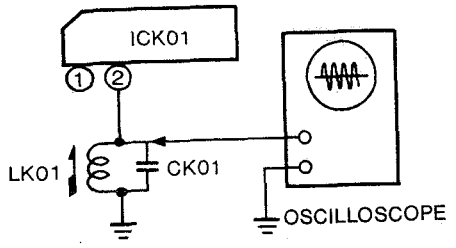


Figure 1. Equipment Connections

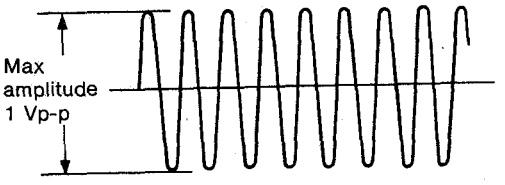


Figure 2. Waveform

TELETEXT ALIGNMENT

SAMPLING CLOCK COIL ADJUSTMENT (L02)

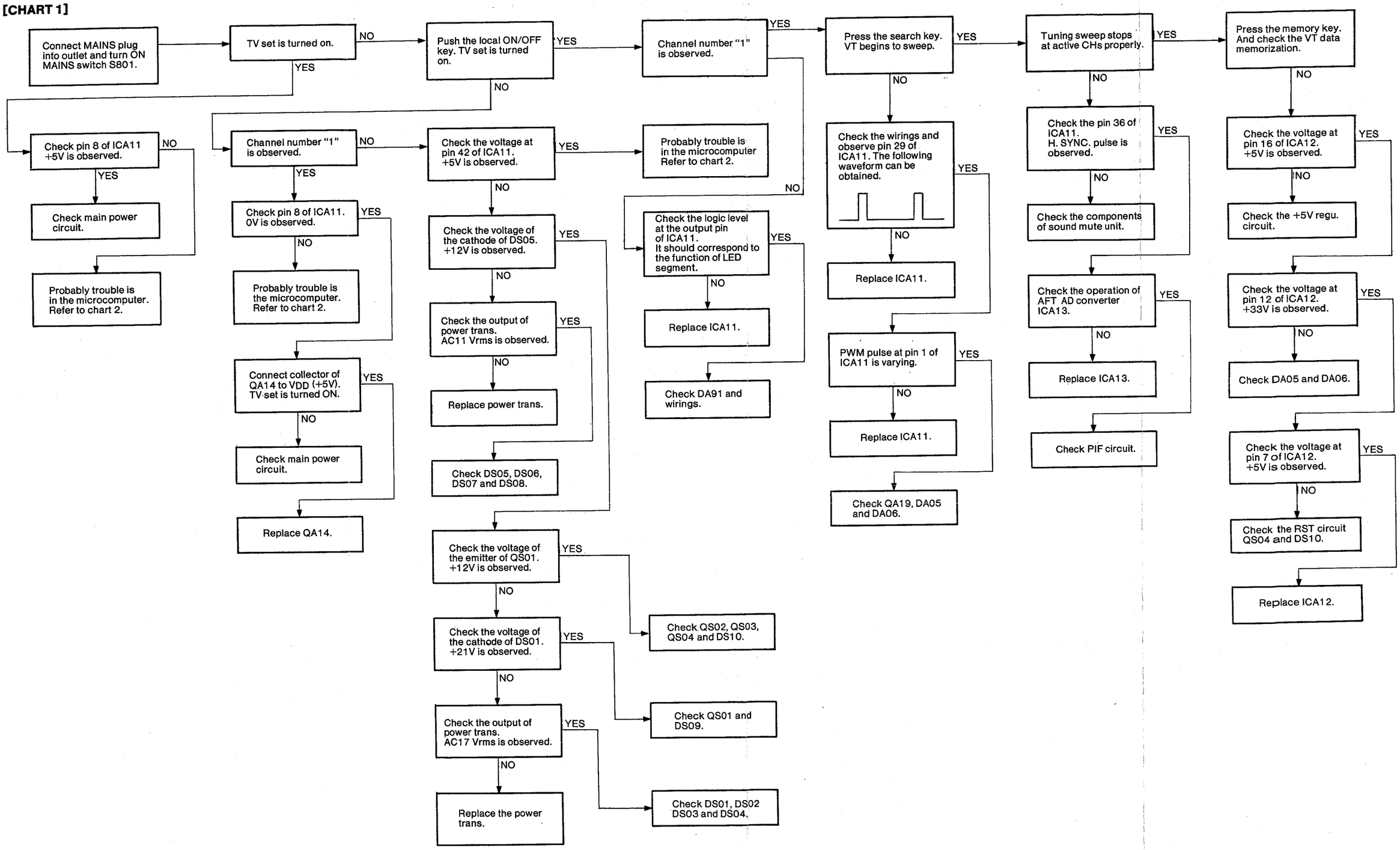
1. Receive a teletext signal.
   (Set the TV in the Teletext mode.)
2. Adjust the sample clock coil (L02) to the position where the normal reception of teletext is obtained.
   (There must be no misoperation.)
3. Check the all text pages for normal reception.
4. If there is a misoperation, repeat the procedures 2 and 3 above.

CHARACTER WHITE BALANCE ADJUSTMENT (RF55, RF56 and RF57)

1. Check the white balance of the regular TV picture for normal.
2. Receive the regular TV picture and set the Color control to minimum.
3. Rotate VR (RF55, RF56, RF57) fully counterclockwise.
4. Remove 2-pin Jumper (MF22) to open the terminal PF22 on the Teletext Board and put MF22 to 2-Pin plug (P530) to short between terminals J and H on the Main Board.
   Screen will show one horizontal line
5. Rotate VR (RF57) to the position where green color just appears on the horizontal line.
6. Adjust VR (RF55, RF56) for the white line on screen.
7. Remove MF22 from P530 and then put MF22 to PF22 on the Teletext panel.
8. Check the white balance with a normal teletext signal received.

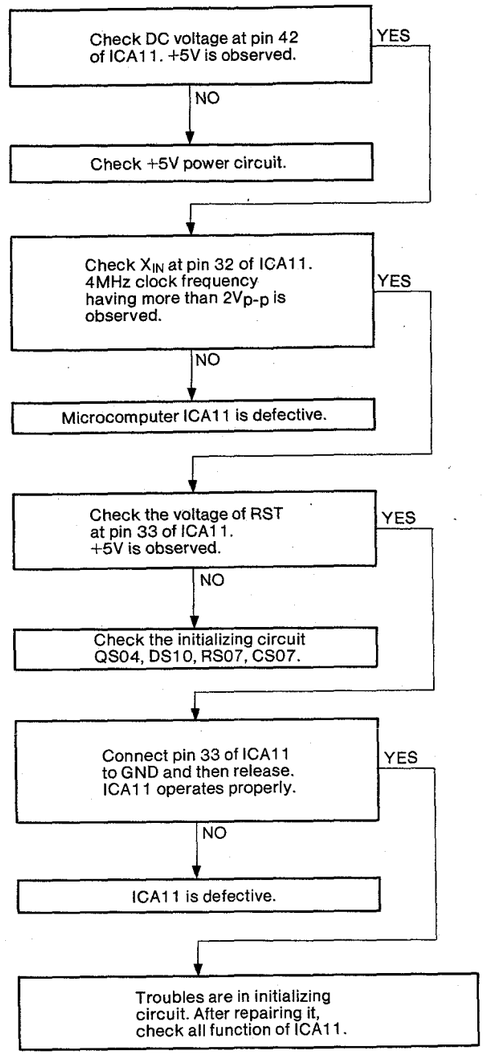
CHANNEL SELECTOR TROUBLESHOOTING CHARTS

[CHART 1]


Connect MAINS plug into outlet and turn ON MAINS switch S801.
TV set is turned on.
NO
YES
Push the local ON/OFF key. TV set is turned on.
YES
NO
Channel number "1" is observed.
YES
Press the search key. VT begins to sweep.
YES
Tuning sweep stops at active CHs properly.
YES
Press the memory key. And check the VT data memorization.
NO
Check pin 8 of ICA11 +5V is observed.
NO
YES
Check main power circuit.
Probably trouble is in the microcomputer. Refer to chart 2.
Channel number "1" is observed.
NO
YES
Check pin 8 of ICA11. 0V is observed.
YES
NO
Probably trouble is the microcomputer. Refer to chart 2.
Connect collector of QA14 to VDD (+5V). TV set is turned ON.
YES
NO
Check main power circuit.
Replace QA14.
Check the voltage at pin 42 of ICA11. +5V is observed.
YES
NO
Probably trouble is in the microcomputer Refer to chart 2.
Check the voltage of the cathode of DS05. +12V is observed.
YES
NO
Check the output of power trans. AC11 Vrms is observed.
YES
NO
Replace power trans.
Check DS05, DS06, DS07 and DS08.
Check the voltage of the emitter of QS01. +12V is observed.
YES
NO
Check QS02, QS03, QS04 and DS10.
Check the voltage of the cathode of DS01. +21V is observed.
YES
NO
Check QS01 and DS09.
Check the output of power trans. AC17 Vrms is observed.
YES
NO
Check DS01, DS02 DS03 and DS04.
Replace the power trans.
NO
Check the logic level at the output pin of ICA11. It should correspond to the function of LED segment.
YES
NO
Replace ICA11.
Check DA91 and wirings.
NO
Check the wirings and observe pin 29 of ICA11. The following waveform can be obtained.
YES
NO
Replace ICA11.
PWM pulse at pin 1 of ICA11 is varying.
YES
NO
Replace ICA11.
Check QA19, DA05 and DA06.
NO
Check the pin 36 of ICA11. H. SYNC. pulse is observed.
YES
NO
Check the components of sound mute unit.
Check the operation of AFT AD converter ICA13.
YES
NO
Replace ICA13.
Check PIF circuit.
NO
Check the voltage at pin 16 of ICA12. +5V is observed.
YES
NO
Check the +5V regu. circuit.
Check the voltage at pin 12 of ICA12. +33V is observed.
YES
NO
Check DA05 and DA06.
Check the voltage at pin 7 of ICA12. +5V is observed.
YES
NO
Check the RST circuit QS04 and DS10.
Replace ICA12.

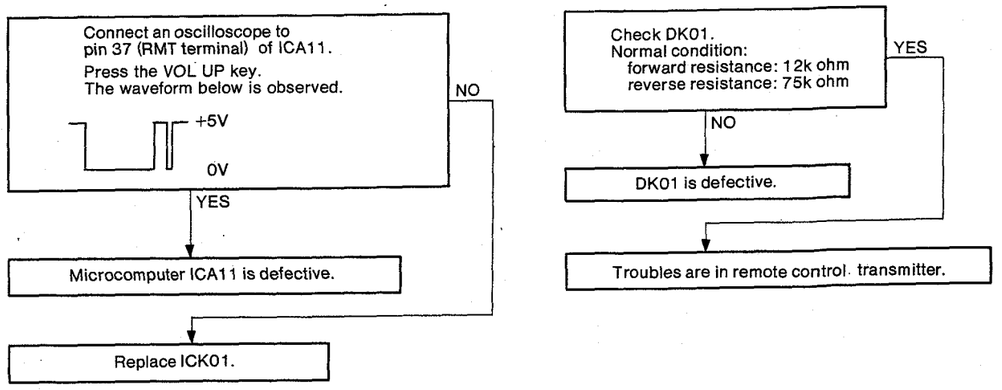
[CHART 2] Microcomputer (ICA11) Operation Check

Note: Before checking Microcomputer, check that control buttons and their connection work properly.

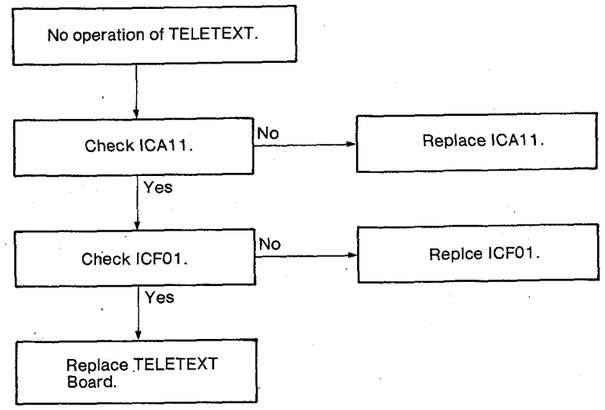

Check DC voltage at pin 42 of ICA11. +5V is observed.
YES
NO
Check +5V power circuit.
Check X_{IN} at pin 32 of ICA11. 4MHz clock frequency having more than 2Vp-p is observed.
YES
NO
Microcomputer ICA11 is defective.
Check the voltage of RST at pin 33 of ICA11. +5V is observed.
YES
NO
Check the initializing circuit QS04, DS10, RS07, CS07.
Connect pin 33 of ICA11 to GND and then release. ICA11 operates properly.
YES
NO
ICA11 is defective.
Troubles are in initializing circuit. After repairing it, check all function of ICA11.

[CHART 3] Remote Control Operation Check

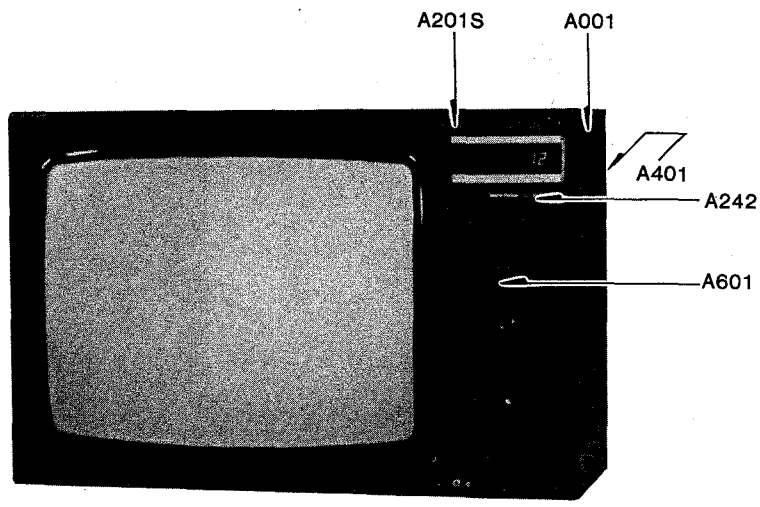
Note: Before checking the operation of remote control transmitter, check that the key operation on TV set is proper.



TELETEXT TROUBLESHOOTING



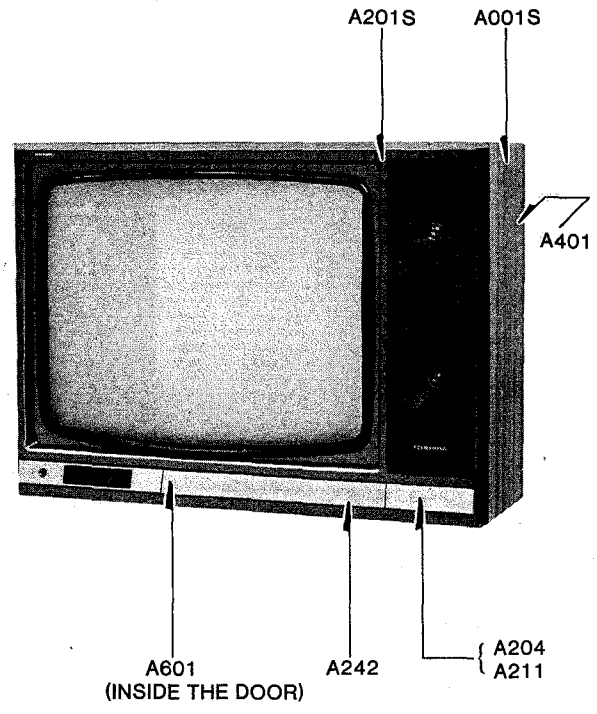
CABINET VIEW AND REPLACEMENT PARTS LIST
MODELS 201T4B:201T4BA



LOCATION NUMBER	PART NUMBER	DESCRIPTION
A001	23887680	*Wood Cabinet, less Front Panel*
A201S	23807822	Front Panel, with Control Panel
A242	23990989	Door
A401	23990909	Back Cover, less label
A411	23989076	*Label, Model No., B/C*
A601	23874860	Knob, Mains
A701	23924909	Carbon, Packaging

LOCATION NUMBER	PART NUMBER	DESCRIPTION
A702	23933531	Packing, Bottom
A703	23933532	Packing, Top
A710	23989073	Label, Model No., Carton
K902	23120820	Remote Hand Held Unit, CT995
Y101	23982689	Operating instruction
Y150	23832441	Holder, RMT Transmitter
Y201	23835806	Assembled Shelf

CABINET VIEW AND REPLACEMENT PARTS LIST
MODEL 221T4B



LOCATION NUMBER	PART NUMBER	DESCRIPTION
A001S	23802534	Assembled Cabinet with Front Panel
A201S	23807734	Front Panel
A204	23832492	Case (B), H.H.U.
A205	23899319	Ornament
A209	23899374	Decorative Board
A211	23832493	Case (A), H.H.U.
A212	23832491	Cover, Upper
A213	23848513	Push Catch
A217	23832490	Cover, Bottom
A242	23830639	Door

LOCATION NUMBER	PART NUMBER	DESCRIPTION
A401	23830394	Back Cover, less label
A411	23989009	Label, Model No.
A601	23874860	Knob, Mains
A701	23925004	Carton, Packaging
A702	23933407	Packing, Bottom
A703	23933408	Packing, Top
A710	23989010	Label, Model No., Carton
K902	23120820	Remote Hand Held Unit, CT995
Y101	23982689	Operating Instruction
Y201	23835806	Assembled Shelf

CHASSIS REPLACEMENT PARTS LIST

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 1 OF THIS MANUAL.

CAUTION: The shaded areas and ⚠ marks in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacement is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 1. Do not degrade the safety of the receiver through improper servicing.

NOTICE: *The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.*

Model 201T4B:201T4BA

ABBREVIATIONS: Capacitors..... CD: Ceramic Disk, PF: Plastic Film, EL: Electrolytic,
Resistors ..... CF: Carbon Film, CC: Carbon Composition, MF: Metal Film,
OMF: Oxide Metal Film, VR: Variable Resistor, FR: Fusible Resistor.

(All CD and PF capacitors are ±5%, 50V and all resistors, ±5%, 1/6W unless otherwise noted.)

LOCATION NUMBER	PART NUMBER	DESCRIPTION
CAPACITORS		
C01	24636010	EL, 1μF, 50V
C02	24634100	EL, 10μF, 25V
C03	24212102	CD, 1000pF, ±10%
C04	24436331	CD, 330pF
C05	24436470	CD, 47pF
C06	24538104	PF, 0.1μF
C07	24232103	CD, 0.01μF, +80%, −20%
C08	24436470	CD, 47pF
C09	24353160	CD, 16pF
C11	24538104	PF, 0.1μF
C13	24636010	EL, 1μF, 50V
C14	24634100	EL, 10μF, 25V
C15	24593392	PF, 3900pF
C16	24636010	EL, 1μF, 50V
C17	24538104	PF, 0.1μF
C18	24634101	EL, 100μF, 25V
C19	24212102	CD, 1000pF, ±10%
C20	24212102	CD, 1000pF, ±10%
C21	24212102	CD, 1000pF, ±10%
C22	24633101	EL, 100μF, 16V
C32	24212102	CD, 1000pF, ±10%
C33	24436270	CD, 27pF
C101	24212102	CD, 1000pF, ±10%
C102	24212102	CD, 1000pF, ±10%
C103	24232103	CD, 0.01μF, +80%, −20%
C104	24232103	CD, 0.01μF, +80%, −20%
C105	24635479	EL, 4.7μF, 35V
C106	24617969	EL, 0.22μF, 50V
C107	24636100	EL, 10μF, 50V
C108	24232103	CD, 0.01μF, +80%, −20%
C111	24212222	CD, 2200pF, ±10%
C115	24212102	CD, 1000pF, ±10%
C161	24212102	CD, 1000pF, ±10%
C162	24232103	CD, 0.01μF, +80%, −20%
C163	24212102	CD, 1000pF, ±10%
C171	24212102	CD, 1000pF, ±10%

LOCATION NUMBER	PART NUMBER	DESCRIPTION
C172	24212102	CD, 1000pF, ±10%
C174	24436130	CD, 13pF, 50V
C175	24436020	CD, 2pF, ±0.25pF
C176	24436020	CD, 2pF, ±0.25pF
C177	24085031	EL, 1μF, 25V, Nonpolar
C202	24436101	CD, 100pF
C204	24636478	EL, 0.47μF, 50V
C207	24636100	EL, 10μF, 50V
C240	24636010	EL, 1μF, 50V
C242	24636479	EL, 4.7μF, 50V
C301	24636010	EL, 1μF, 50V
C302	24232103	CD, 0.01μF, +80%, −20%
C303	24212561	CD, 560pF, ±10%
C304	24593122	PF, 1200pF
C305	24538333	PF, 0.033μF
C306	24538224	PF, 0.22μF
C307	24212101	CD, 100pF, ±10%
C309	24617981	EL, 2.2μF, 50V
C310	24636478	EL, 0.47μF, 50V
C311	24635331	EL, 330μF
C312	24232103	CD, 0.01μF, +80%, −20%
C313	24635101	EL, 100μF, 35V
C316	24795472	EL, 4700μF
C317	24617996	EL, 3.3μF
C318	24214332	CD, 3300pF, ±10%, 500V
C319	24636478	EL, 0.47μF, 50V
C371	24591682	PF, 6800pF
C401	24867912	PF, 9100pF
C402	24636478	EL, 0.47μF, 50V
C403	24598562	PF, 5600pF
C405	24598302	PF, 3000pF
C406	24636229	EL, 2.2μF, 50V
C407	24636229	EL, 2.2μF, 50V
C408	24635100	EL, 10μF, 35V
C409	24232103	CD, 0.01μF, +80%, −20%
C410	24212152	CD, 1500pF, ±10%
C416	24214271	CD, 270pF, ±10%, 500V

LOCATION NUMBER	PART NUMBER	DESCRIPTION
⚠C440	24095890	CD, 8200pF, 1600V
C442	24095961	PF, 0.43μF, 200V
⚠C444	24442561	CD, 560pF, ±10%, 2kV
C445	24095903	PF, 0.056μF, ±10%, 250V
C447	24644479	EL, 4.7μF, 250V
C448	24633222	EL, 2200μF, 16V
C449	24633471	EL, 470μF, 16V
C450	24828124	PF, 0.12μF, 200V
C463	24212222	CD, 2200pF, ±10%
C501	24436180	CD, 18pF
C502	24436100	CD, 10pF, ±0.25pF
C504	24636010	EL, 1μF, 50V
C506	24232103	CD, 0.01μF, +80%, −20%
C507	24232103	CD, 0.01μF, +80%, −20%
C508	24340160	CD, 16pF, ±10%
C509	24232103	CD, 0.01μF, +80%, −20%
C510	24232103	CD, 0.01μF, +80%, −20%
C511	24232103	CD, 0.01μF, +80%, −20%
C512	24356121	CD, 120pF
C513	24232103	CD, 0.01μF, +80%, −20%
C514	24636478	EL, 0.47μF, 50V
C515	24436200	CD, 20pF
C516	24353330	CD, 33pF
C517	24353680	CD, 68pF
C518	24636479	EL, 4.7μF, 50V
C519	24692223	PF, 0.022μF
C520	24692223	PF, 0.022μF
C523	24530473	PF, 0.047μF, ±10%, 63V
C524	24436270	CD, 27pF
C527	24636100	EL, 10μF, 50V
C531	24212391	CD, 390pF, ±10%
C532	24212391	CD, 390pF, ±10%
C533	24212391	CD, 390pF, ±10%
C601	24436470	CD, 47pF
C602	24436470	CD, 47pF
C603	24232103	CD, 0.01μF, +80%, −20%
C604	24591472	PF, 4700pF
C606	24636010	EL, 1μF, 50V
C608	24636339	EL, 3.3μF, 50V
C609	24636339	EL, 3.3μF, 50V
C617	24353620	CD, 62pF
C619	24636100	EL, 10μF, 50V
C620	24538104	PF, 0.1μF
C621	24636100	EL, 10μF, 50V
C622	24538104	PF, 0.1μF
C623	24538104	PF, 0.1μF
C624	24538123	PF, 0.012μF
C625	24538473	PF, 0.047μF
C626	24636100	EL, 10μF, 50V
C627	24538224	PF, 0.22μF
C628	24636010	EL, 1μF, 50V
C629	24538104	PF, 0.1μF
C630	24633101	EL, 100μF, 16V
C631	24538224	PF, 0.22μF
C632	24636010	EL, 1μF, 50V
C633	24530223	PF, 0.022μF, ±10%, 63V
C635	24436101	CD, 100pF, ±10%
C636	24634102	EL, 1000μF, 25V
C637	24636100	EL, 10μF, 50V
C640	24633101	EL, 100μF, 16V
C641	24436181	CD, 180pF
C643	24636229	EL, 2.2μF, 50V
C662	24602474	PF, 0.47μF
C801	24098999	PF, 0.1μF, ±20%, AC250V

LOCATION NUMBER	PART NUMBER	DESCRIPTION
C803	24094906	CD, 4700pF, +80%, −20%, AC 250V
C804	24094906	CD, 4700pF, +80%, −20%, AC 250V
C805	24094906	CD, 4700pF, +80%, −20%, AC 250V
C806	24094906	CD, 4700pF, +80%, −20%, AC 250V
C810	24086987	EL, 120μF, 400V
C811	24641100	EL, 10μF, 10V
C812	24640972	EL, 33μF, 160V
C813	24211102	CD, 1000pF, ±10%, 2kV
C814	24215102	CD, 1000pF, ±10%, 1kV
C820	24214221	CD, 220pF, ±10%, 500V
C830	24634471	EL, 470μF, 25V
C835	24094916	CD, 4700pF, ±20%, AC400V
C901	24644010	EL, 1μF, 250V
C902	24095512	PF, 4700pF, 1600V
CA01	24636010	EL, 1μF, 50V
CA02	24232103	CD, 0.01μF, +80%, −20%
CA07	24633470	EL, 47μF, 16V
CA11	24436101	CD, 100pF, ±10%
CA12	24436101	CD, 100pF, ±10%
CA13	24232103	CD, 0.01μF, +80%, −20%
CA14	24633470	EL, 47μF, 16V
CA15	24212102	CD, 1000pF, ±10%
CA16	24436221	CD, 220 pF
CA17	24538104	PF, 0.1μF
CA18	24538104	PF, 0.1μF
CA20	24591103	PF, 0.01μF
CA21	24212681	CD, 680pF, ±10%
CA22	24212152	CD, 1500pF, ±10%
CA23	24212102	CD, 1000pF, ±10%
CA24	24212391	CD, 390pF, ±10%
CA25	24633100	EL, 10μF, 16V
CA26	24636010	EL, 1μF, 50V
CA27	24232103	CD, 0.01μF, +80%, −20%
CA28	24232103	CD, 0.01μF, +80%, −20%
CA29	24232103	CD, 0.01μF, +80%, −20%
CB02	24636229	EL, 2.2μF, 50V
CB03	24530104	PF, 0.1μF, ±10%, 63V
CB04	24436390	CD, 39pF
CB05	24353180	CD, 18pF
CB06	24212102	CD, 1000pF, ±10%
CB07	24232103	CD, 0.01μF, +80%, −20%
CB08	24212102	CD, 1000pF, ±10%
CB09	24633330	EL, 33μF, 16V
CB10	24212102	CD, 1000pF, ±10%
CB11	24232103	CD, 0.01μF, +80%, −20%
CF01	24636229	EL, 2.2μF, 50V
CF02	24538104	PF, 0.1μF
CF03	24636010	EL, 1μF, 50V
CF04	24636010	EL, 1μF, 50V
CF05	24636010	EL, 1μF, 50V
CF06	24436271	CD, 270pF
CF07	24436271	CD, 270pF
CF08	24436271	CD, 270pF
CF10	24232103	CD, 0.01μF, +80%, −20%
CF11	24636010	EL, 1μF, 50V
CF13	24636221	EL, 220μF, 50V
CF14	24232103	CD, 0.01μF, +80%, −20%
CK01	24598222	PF, 0.022μF
CK02	24538683	PF, 0.068μF
CK03	24633100	EL, 10μF, 16V

LOCATION NUMBER	PART NUMBER	DESCRIPTION
CK04	24633330	EL, 33μF, 16V
CK05	24633100	EL, 10μF, 16V
CK06	24633100	EL, 10μF, 16V
CK07	24692222	PF, 2200pF
CR41	24636339	EL, 3.3μF, 50V
CR42	24232103	CD, 0.01μF, +80%, −20%
CR61	24636100	EL, 10μF, 50V
CR62	24232103	CD, 0.01μF, +80%, −20%
CR71	24636339	EL, 3.3μF, 50V
CR72	24232103	CD, 0.01μF, +80%, −20%
CS01	24635471	EL, 470μF, 35V
CS02	24634102	EL, 1000μF, 25V
CS03	24635100	EL, 10μF, 35V
CS04	24635100	EL, 10μF, 35V
CS07	24633470	EL, 47μF, 16V
RESISTORS		
R01	24366104	CF, 100k ohm
R04	24366102	CF, 1k ohm
R05	24366682	CF, 6800 ohm
R06	24366682	CF, 6800 ohm
R07	24366681	CF, 680 ohm
R08	24366152	CF, 1500 ohm
R11	24366122	CF, 1200 ohm
R12	24366122	CF, 1200 ohm
R13	24366122	CF, 1200 ohm
R19	24890682	CF, 6800 ohm, 1/4W
R26	24366102	CF, 1k ohm
R28	24366471	CF, 470 ohm
R29	24366471	CF, 470 ohm
R30	24366471	CF, 470 ohm
R32	24366683	CF, 68k ohm
R35	24366223	CF, 22k ohm
R36	24366223	CF, 22k ohm
R37	24890332	CF, 3300 ohm, 1/4W
R38	24366473	CF, 47k ohm
R39	24366472	CF, 4700 ohm
R101	24890102	CF, 1k ohm, 1/4W
R104	24366683	CF, 68k ohm
R105	24366221	CF, 220 ohm
R107	24366824	CF, 820k ohm
R108	24890392	CF, 3900 ohm, 1/4W
R109	24366224	CF, 220k ohm
R151	24061669	VR, 5k ohm, 1/8W
R152	24061662	VR, 1M ohm, 1/8W
R161	24366181	CF, 180 ohm
R162	24366102	CF, 1k ohm
R163	24366562	CF, 5600 ohm
R164	24366221	CF, 220 ohm
R165	24366681	CF, 680 ohm
R166	24366270	CF, 27 ohm
R171	24890122	CF, 1200 ohm, 1/4W
R172	24366122	CF, 1200 ohm
R201	24366221	CF, 220 ohm
R202	24366152	CF, 1500 ohm
R203	24890162	CF, 1600 ohm, 1/4W
R204	24366102	CF, 1k ohm
R207	24366561	CF, 560 ohm
R209	24366473	CF, 47k ohm
R210	24366162	CF, 1600 ohm
R212	24890103	CF, 10k ohm, 1/4W
R213	24366183	CF, 18k ohm
R214	24366162	CF, 1600 ohm
R215	24890822	CF, 8200 ohm, 1/4W
R218	24890101	CF, 100 ohm, 1/4W

LOCATION NUMBER	PART NUMBER	DESCRIPTION
R220	24890152	CF, 1500 ohm, 1/4W
R230	24366471	CF, 470 ohm
R231	24366101	CF, 100 ohm
R232	24366101	CF, 100 ohm
R240	24366273	CF, 27k ohm
R241	24366154	CF, 150k ohm
R242	24366474	CF, 470k ohm
R243	24366913	CF,91K ohm
R252	24061613	VR, 200 ohm, 1/10W
R253	24061613	VR, 200 ohm, 1/10W
R255	24061610	VR, 2k ohm, 1/10W
R256	24060480	VR, 10k ohm, 0.15W
R257	24063937	VR, 500 ohm, 1/10W
R265	24366101	CF, 100 ohm
R301	24366511	CF, 510 ohm
R302	24366564	CF, 560k ohm
R303	24890564	CF, 560k ohm, 1/4W
R304	24366103	CF, 10k ohm
R306	24366751	CF, 750 ohm
R307	24366563	CF, 56k ohm
R308	24366393	CF, 39k ohm
R309	24366244	CF, 240k ohm
R310	24946825	CC, 8.2M ohm, ±10%, 1/2W
R311	24890393	CF, 39k ohm, 1/4W
R315	24890163	CF, 16k ohm
R316	24366364	CF, 360k ohm
⚠R317	24552102	OMF, 1k ohm, 1/2W
R319	24366202	CF, 2200 ohm
R320	24366102	CF, 1k ohm
⚠R321	24552222	OMF, 2.2k ohm, 1/2W
⚠R322	24553112	OMF, 1.1k ohm, 1W
⚠R323	24983129	OMF, 1.2 ohm, 1W
R324	24890123	CF, 12k ohm, 1/4W
⚠R327	24547759	FR, 7.5 ohm, 1W
R328	24890682	CF, 6800 ohm, 1/4W
R330	24366114	CF, 110k ohm
⚠R331	24552102	OMF, 1k ohm, 1/2W
⚠R332	24552102	OMF, 1k ohm, 1/2W
R333	24366331	CF, 330 ohm
R351	24061664	VR, 200k ohm, 1/8W
R352	24061606	VR, 50k ohm, 1/10W
R381	24366302	CF, 3k ohm
R382	24366103	CF, 10k ohm
R383	24366133	CF, 13k ohm
R384	24366302	CF, 3k ohm
R385	24366512	CF, 5100 ohm
R401	24899111	CF, 110 ohm
R402	24366273	CF, 27k ohm
R403	24366362	CF, 3600 ohm
R404	24890222	CF, 2200 ohm, 1/4W
R405	24366363	CF, 36k ohm
R406	24009990	CF, 150k ohm, ±2%, 1/4W
⚠R407	24384682	OMF, 6800 ohm, 3W
R408	24366182	CF, 1800 ohm
⚠R410	24000947	OMF, 15k ohm, ±2%, 1/2W
R411	24890330	CF, 33 ohm, 1/4W
⚠R416	24009992	OMF, 2k ohm, 3W
⚠R420	24553102	OMF, 1k ohm, 1W
⚠R421	24383511	OMF, 510 ohm, 2W
⚠R440	24552103	OMF, 10k ohm, 1/2W
⚠R441	24552103	OMF, 10k ohm, 1/2W
⚠R444	24982109	MF, 1 ohm, 1/2W
⚠R448	24983399	OMF, 3.9 ohm, 1W
R451	24061668	VR, 10k ohm, 1/8W
⚠R461	24552181	OMF, 180 ohm, 1/2W

LOCATION NUMBER	PART NUMBER	DESCRIPTION
R501	24366821	CF, 820 ohm
R502	24890242	CF, 2400 ohm, 1/4W
R504	24366334	CF, 330k ohm
R505	24890103	CF, 10k ohm, 1/4W
R506	24366162	CF, 1600 ohm
R509	24366391	CF, 390 ohm
R510	24366471	CF, 470 ohm
R511	24366153	CF, 15k ohm
R512	24890104	CF, 100k ohm, 1/4W
R514	24366511	CF, 510 ohm
R515	24366821	CF, 820 ohm
R517	24366823	CF, 82k ohm
R518	24366273	CF, 27k ohm
R519	24366273	CF, 27k ohm
R520	24366122	CF, 1200 ohm
R522	24890272	CF, 2700 ohm, 1/4W
R524	24890272	CF, 2700 ohm, 1/4W
R526	24366272	CF, 2700 ohm
R528	24366101	CF, 100 ohm
R529	24366101	CF, 100 ohm
R530	24366101	CF, 100 ohm
⚠R533	24382433	OMF, 43k ohm, 1W
⚠R534	24382433	OMF, 43k ohm, 1W
⚠R535	24382433	OMF, 43k ohm, 1W
R540	24366181	CF, 180 ohm
R541	24366161	CF, 160 ohm
R542	24366181	CF, 180 ohm
R543	24380221	CF, 220 ohm
R544	24380221	CF, 220 ohm
R545	24380221	CF, 220 ohm
R551	24061671	VR, 1k ohm, 1/8W
R552	24061669	VR, 5k ohm, 1/8W
R555	24060480	VR, 10k ohm, 0.15W
R557	24061608	VR, 10k ohm, 1/10W
R558	24061608	VR, 10k ohm, 1/10W
R559	24061608	VR, 10k ohm, 1/10W
R561	24890472	CF, 4700 ohm, 1/4W
⚠R591	24009974	OMF, 15k ohm, 2W
⚠R592	24009974	OMF, 15k ohm, 2W
⚠R593	24009974	OMF, 15k ohm, 2W
R602	24366222	CF, 2200 ohm
R603	24366103	CF, 10k ohm
R604	24366104	CF, 100k ohm
R605	24366302	CF, 3k ohm
R606	24366472	CF, 4700 ohm
R611	24366332	CF, 3300 ohm
R612	24366471	CF, 470 ohm
R614	24366102	CF, 1k ohm
R616	24366102	CF, 1k ohm
R617	24366682	CF, 6800 ohm
R618	24366153	CF, 15k ohm
R619	24366103	CF, 10k ohm
R620	24890102	CF, 1k ohm, 1/4W
R621	24366102	CF, 1k ohm
R622	24366102	CF, 1k ohm
⚠R623	24321479	MF, 4.7 ohm
R624	24366334	CF, 330k ohm
R625	24890562	CF, 5600 ohm, 1/4W
R626	24890223	CF, 22k ohm, 1/4W
R636	24366102	CF, 1k ohm
⚠R637	24552471	OMF, 470 ohm, 1/2W
⚠R640	24552331	OMF, 330 ohm, 1/2W
R641	24366104	CF, 100k ohm
R642	24366563	CF, 56k ohm
R643	24366511	CF, 510 ohm

LOCATION NUMBER	PART NUMBER	DESCRIPTION
R649	24890272	CF, 2700 ohm, 1/4W
R651	24060478	VR, 50k ohm, 0.15W
R653	24060420	VR, 10k ohm, 0.15W, CC
R654	24060420	VR, 10k ohm, 0.15W, CC
R659	24061672	VR, 500 ohm, 1/8W
R661	24946101	CC, 100 ohm, ±10%, 1/2W
⚠R801	24007688	Cement, 6.2 ohm, 9W
R811	24942224	CC, 220k ohm, 1/2W
⚠R812	24552301	OMF, 300 ohm, 1/2W
⚠R813	24553300	OMF, 30 ohm, 1W
⚠R814	24982759	MF, 7.5 ohm, 1/2W
R815	24946334	CC, 330k ohm, ±10%, 1/2W
R816	24946334	CC, 330k ohm, ±10%, 1/2W
⚠R817	24553201	OMF, 200 ohm, 1W
R818	24366102	CF, 1k ohm
R819	24942114	CC, 110k ohm, 1/2W
R820	24942114	CC, 110k ohm, 1/2W
R821	24941102	CC, 1k ohm, 1/4W
⚠R831	24321278	OMF, 0.27 ohm, 1/2W
R890	24000918	PTC Thermistor, 18 ohm, 290V
R901	24946152	CC, 1500 ohm, ±10%, 1/2W
R902	24946152	CC, 1500 ohm, ±10%, 1/2W
R903	24946152	CC, 1500 ohm, ±10%, 1/2W
⚠R920	24000945	FR, 1.8 ohm, 2W
⚠RA01	24383133	OMF, 13k ohm, 2W
RA09	24366332	CF, 3300 ohm
RA11	24366102	CF, 1k ohm
RA12	24366223	CF, 22k ohm
RA13	24366223	CF, 22k ohm
RA14	24366682	CF, 6800 ohm
RA15	24366272	CF, 2700 ohm
RA16	24366153	CF, 15k ohm
RA17	24366153	CF, 15k ohm
RA18	24366153	CF, 15k ohm
RA19	24366153	CF, 15k ohm
RA20	24890153	CF, 15k ohm, 1/4W
RA21	24366391	CF, 390 ohm
RA22	24366391	CF, 390 ohm
RA23	24366391	CF, 390 ohm
RA24	24366391	CF, 390 ohm
RA25	24366391	CF, 390 ohm
RA26	24366391	CF, 390 ohm
RA27	24366391	CF, 390 ohm
RA28	24366102	CF, 1k ohm
RA29	24366102	CF, 1k ohm
RA30	24366102	CF, 1k ohm
RA31	24366102	CF, 1k ohm
RA33	24890102	CF, 1k ohm, 1/4W
RA34	24890104	CF, 100k ohm, 1/4W
RA35	24366103	CF, 10k ohm
RA36	24366472	CF, 4700 ohm
RA37	24366103	CF, 10k ohm
RA38	24366203	CF, 20k ohm
RA39	24366333	CF, 33k ohm
RA40	24366333	CF, 33k ohm
RA41	24366333	CF, 33k ohm
RA42	24890153	CF, 15k ohm, 1/4W
RA43	24366221	CF, 220 ohm
RA44	24366104	CF, 100k ohm
RA45	24366471	CF, 470 ohm
RA46	24366471	CF, 470 ohm
RA47	24890471	CF, 470 ohm, 1/4W
RA48	24366391	CF, 390 ohm
RA49	24890102	CF, 1k ohm, 1/4W

LOCATION NUMBER	PART NUMBER	DESCRIPTION
RA60	24890102	CF, 1k ohm, 1/4W
RA61	24890222	CF, 2200 ohm, 1/4W
RA62	24890222	CF, 2200 ohm, 1/4W
RA63	24890154	CF, 150k ohm, 1/4W
RA64	24366472	CF, 4700 ohm
RA65	24366562	CF, 5600 ohm
RA66	24366103	CF, 10k ohm
RA69	24366103	CF, 10k ohm
RA71	24366224	CF, 220k ohm
RA72	24366224	CF, 220k ohm
RA74	24366224	CF, 220k ohm
RA75	24366224	CF, 220k ohm
RA76	24366434	CF, 430k ohm
RA77	24366103	CF, 10k ohm
RA79	24366243	CF, 24k ohm
RA80	24366753	CF, 75k ohm
RA81	24366105	CF, 1000k ohm
RA82	24366563	CF, 56k ohm
RA83	24366563	CF, 56k ohm
RA84	24366105	CF, 1000k ohm
RA85	24366562	CF, 5600 ohm
RA87	24890183	CF, 18k ohm, 1/4W
RA88	24890222	CF, 2200 ohm, 1/4W
RA89	24366434	CF, 430k ohm
RA91	24890391	CF, 390 ohm, 1/4W
RA92	24890391	CF, 390 ohm, 1/4W
RB02	24366471	CF, 470 ohm
RB04	24366471	CF, 470 ohm
RB05	24366272	CF, 2700 ohm
⚠RB06	24552560	OMF, 56 ohm, 1/2W
RB07	24366150	CF, 15 ohm
RB08	24366331	CF, 330 ohm
RF01	24366392	CF, 3900 ohm
RF02	24366682	CF, 6800 ohm
RF03	24366272	CF, 2700 ohm
RF04	24366272	CF, 2700 ohm
RF05	24366272	CF, 2700 ohm
RF07	24366272	CF, 2700 ohm
RF08	24366272	CF, 2700 ohm
RF12	24366222	CF, 2200 ohm
RF13	24366222	CF, 2200 ohm
RF14	24366222	CF, 2200 ohm
RF16	24366122	CF, 1200 ohm
RF17	24366122	CF, 1200 ohm
RF18	24366122	CF, 1200 ohm
RF20	24890121	CF, 1k ohm, 1/4W
RF21	24890121	CF, 1k ohm, 1/4W
RF22	24890121	CF, 1k ohm, 1/4W
RF23	24890103	CF, 10k ohm, 1/4W
RF24	24366221	CF, 220 ohm
RF25	24366271	CF, 270 ohm
RF26	24366271	CF, 270 ohm
RF27	24366271	CF, 270 ohm
RF28	24552241	PF, 240 ohm, 1/2W
RF29	24366562	CF, 5600 ohm
RF30	24366222	CF, 2200 ohm
RF31	24366222	CF, 2200 ohm
RF32	24890103	CF, 10k ohm, 1/4W
RF33	24890103	CF, 10k ohm, 1/4W
RF34	24890103	CF, 10k ohm, 1/4W
RF37	24366272	CF, 2700 ohm
RF38	24366103	CF, 10k ohm
RF39	24366562	CF, 5600 ohm
RF40	24366221	CF, 220 ohm
RF41	24890101	CF, 100 ohm, 1/4W

LOCATION NUMBER	PART NUMBER	DESCRIPTION
⚠RF42	24552680	OMF, 68 ohm, 1/2W
RF55	24061608	VR, 10k ohm, 1/10W
RF56	24061608	VR, 10k ohm, 1/10W
RF57	24061608	VR, 10k ohm, 1/10W
RK01	24366223	CF, 22k ohm
RK02	24366103	CF, 10k ohm
RK03	24366220	CF, 22 ohm
RK04	24366222	CF, 2200 ohm
RR43	24366123	CF, 12k ohm
RR44	24366473	CF, 47k ohm
RR45	24366472	CF, 4700 ohm
RR46	24366563	CF, 56k ohm
RR64	24366122	CF, 1200 ohm
RR65	24366104	CF, 100k ohm
RR66	24366222	CF, 2200 ohm
RR67	24890222	CF, 2200 ohm, 1/4W
RR73	24366123	CF, 12k ohm
RR74	24366473	CF, 47k ohm
RR75	24366472	CF, 4700 ohm
RR76	24890272	CF, 2700 ohm, 1/4W
⚠RS01	24552511	OMF, 510 ohm, 1/2W
RS02	24366182	CF, 1800 ohm
⚠RS06	24983478	OMF, 0.47 ohm, 1W
RS07	24366102	CF, 1k ohm
COILS & TRANSFORMERS		
L02	23262826	Coil, TRF1067
L03	23238920	Coil, Peaking, TRF4150AC
L102	23262855	Coil, PIF, TRF1453
L103	23262881	Coil, AFT, TRF1445
L105	23237990	Coil, Peaking, TRF4569AC
L106	23261051	Coil, Choke, AZ9246E
L161	23262951	Coil, TRF1019
L162	23261985	Coil, RF Choke, TRF9221
L171	23262881	Coil, AFT, TRF1445
L201	23237987	Coil, Peaking, TRF4100AC
L410	23221026	Coil, Choke, AZ9004Y
L411	23222673	Coil, H. Linearity, AT4042/30
L501	23237981	Coil, Peaking, TRF4330AC
L502	23237987	Coil, Peaking, TRF4100AC
L503	23237911	Coil, peaking, TRF4201AC
L551	23250972	Coil, 1H-DL Matching, TRF5418
L552	23250972	Coil, 1H-DL Matching, TRF5418
L601	23237986	Coil, Peaking, TRF4120AC
L602	23252198	Coil, SIF, TRF6702
L811	23261975	Coil, Choke, TRF9229
⚠L901	23209999	Coil, Degaussing, Type 94350
LA11	23237999	Coil, Peaking, TRF4109AC
LB01	23262842	Coil, PIF
LK01	23232963	Coil, TRF3055
LK02	23232963	Coil, TRF3055
⚠T401	23224988	Transformer, Horiz Drive, TLN1032
⚠T461	23226423	Transformer, Horiz Output, TFB4023AD
T801	23211970	Transformer, Line Filter, TRF3110
⚠T802	23213813	Transformer, Converter, TPW3050
⚠T803	23213808	Transformer, Power, TPW1282
SEMICONDUCTORS		
IC01	23119519	IC, SAA5020
IC02	23119518	IC, SAA5030
IC03	23119517	IC, SAA5040B

LOCATION NUMBER		PART NUMBER	DESCRIPTION
IC04		23119516	IC, SAA5050
IC06		23119515	IC, N74LS83AN
IC07		23119514	IC, N74LS161N
IC08		23119514	IC, N74LS161N
IC09		B0423144	IC, TMM314APL
IC09	or	23119499	IC, SBB2114
IC09	or	23119498	IC, SBB2114L
IC09	or	23119497	IC, μPD2114LC
IC09	or	23119482	IC, TMS2114
IC09	or	23119446	IC, TMM2114AP-12
IC09	or	23119444	IC, TMM2114AP-15
IC10		B0423144	IC, TMM314APL
IC10	or	23119499	IC, SBB2114
IC10	or	23119498	IC, SBB2114L
IC10	or	23119497	IC, μPD2114LC
IC10	or	23119482	IC, TMS2114
IC10	or	23119446	IC, TMM2114AP-12
IC10	or	23119444	IC, TMM2114AP-15
IC11		23119513	IC, N74LS02N
IC12		B0470116	IC, TC4011BP
IC101		B0356804	IC, TA7680AP
IC303		23119533	IC, TDA3651A
IC501		B0357050	IC, TA7699AP
IC620		23119458	IC, TD1524A
IC621		23119532	IC, TDA1015
ICA11		B0406818	IC, TMP47C432N-8884
ICA12		B0428420	IC, TMM842P
ICA13		B0349250	IC, TA75393S
ICF01		23119723	IC, AN5352
ICK01		23119566	IC, μPC1474HA
Q13		A6317547	Transistor, 2SC1815-Y
Q14		23114689	Transistor, BC547A
Q161		23114690	Transistor, BF199
Q201		23114689	Transistor, BC547A
Q302		23114691	Transistor, BC557A
Q371		23114632	Transistor, BC547B
Q372		23114632	Transistor, BC547B
Q402		A6330004	Transistor, 2SC2482 FA-1
⚠Q404		A6868702	Transistor, 2SD1427
Q505		23114693	Transistor, BF871
Q506		A6330000	Transistor, 2SC2482
Q507		23114693	Transistor, BF871
Q508		A6330000	Transistor, 2SC2482
Q509		23114693	Transistor, BF871
Q510		A6330000	Transistor, 2SC2482
Q611		23114691	Transistor, BC557A
Q622		23114689	Transistor, BC547A
Q640		23114689	Transistor, BC547A
⚠Q801		23114568	Transistor, STR5412
Q802		A6328330	Transistor, 2SC2383-Y
Q802	or	A6328320	Transistor, 2SC2383-O
Q803		23114689	Transistor, BC547A
QA02		23114691	Transistor, BC557A
QA14		23114691	Transistor, BC557A
QA15		23114691	Transistor, BC557A
QA16		23114689	Transistor, BC547A
QA18		A6048371	Transistor (FET), 2SK30ATM-GR
QA19		23114689	Transistor, BC547A
QB01		23114687	Transistor, BF324
QF02		23114691	Transistor, BC557A
QF03		23114691	Transistor, BC557A
QF04		23114691	Transistor, BC557A
QF05		23114689	Transistor, BC547A
QF06		23114689	Transistor, BC547A

LOCATION NUMBER	PART NUMBER	DESCRIPTION
QF07	23114688	Transistor, BC327
QF08	23114689	Transistor, BC547A
QR41	23114689	Transistor, BC547A
QR42	23114691	Transistor, BC557A
QR62	23114546	Transistor, BC557B
QR71	23114689	Transistor, BC547A
QR72	23114691	Transistor, BC557A
QS01	23114674	Transistor, BDT31A
QS02	A6625170	Transistor, 2SB686-0
QS03	23114689	Transistor, BC547A
QS04	23114691	Transistor, BC557A
D01	23115599	Diode, 1N4148
D02	23115599	Diode, 1N4148
D03	23115599	Diode, 1N4148
D04	23115599	Diode, 1N4148
D202	23115599	Diode, 1N4148
D203	23115599	Diode, 1N4148
D204	23115599	Diode, 1N4148
D205	23115599	Diode, 1N4148
D241	23115599	Diode, 1N4148
D242	23115599	Diode, 1N4148
D243	A7150041	Diode, 1SS104
D244	23115599	Diode, 1N4148
D301	23115599	Diode, 1N4148
D302	23115599	Diode, 1N4148
D305	23115599	Diode, 1N4148
D309	23115599	Diode, 1N4148
D371	23115599	Diode, 1N4148
D406	23115599	Diode, 1N4148
D408	23115599	Diode, 1N4148
D415	23115599	Diode, 1N4148
D591	23115599	Diode, 1N4148
D592	23115599	Diode, 1N4148
D593	23115599	Diode, 1N4148
⚠D640	A8641942	Photo Coupler, TLP631
D641	23118984	Diode, Zener, ZPD9.1
D644	23115599	Diode, 1N4148
D801	A7568410	Diode, TVR-4J
D802	A7568410	Diode, TVR-4J
D803	A7568410	Diode, TVR-4J
D804	A7568410	Diode, TVR-4J
⚠D806	23115523	Diode, SR-2M
D807	23115530	Diode, RG2
D808	23115596	Diode, BYV95C
D809	23115596	Diode, BYV95C
D830	23115596	Diode, BYV95C
DA05	23115878	Diode, Zener, μPC574JC
DA06	23115599	Diode, 1N4148
DA11	23115599	Diode, 1N4148
DA12	23115599	Diode, 1N4148
DA13	23115599	Diode, 1N4148
DA14	23115599	Diode, 1N4148
DA15	23115599	Diode, 1N4148
DA16	23115599	Diode, 1N4148
DA17	23115599	Diode, 1N4148
DA18	23115599	Diode, 1N4148
DA19	23115599	Diode, 1N4148
DA91	23118971	Diode (LED), MAN6410, DISPLAY
DF01	23115599	Diode, 1N4148
DF02	23115599	Diode, 1N4148
DF03	23115599	Diode, 1N4148
DF04	23115599	Diode, 1N4148
DF05	23115599	Diode, 1N4148
DF06	23115599	Diode, 1N4148

LOCATION NUMBER	PART NUMBER	DESCRIPTION
DK01	23115594	Diode, SFH205, I.R. Sensor
DR41	23115599	Diode, 1N4148
DR71	23115599	Diode, 1N4148
DR90	23118969	Diode (LED), MV57124, Red
DS01	23115593	Diode, 1N4002
DS02	23115593	Diode, 1N4002
DS03	23115593	Diode, 1N4002
DS04	23115593	Diode, 1N4002
DS05	23115593	Diode, 1N4002
DS06	23115593	Diode, 1N4002
DS07	23115593	Diode, 1N4002
DS08	23115593	Diode, 1N4002
DS09	23115525	Diode, Zener, BZX79B12
DS10	23115526	Diode, Zener, BZX79B5V1
MISCELLANEOUS		
E505	23198889	CRT Wire Assembly A
⚠E512	23134987	Rim Band Insulator
⚠F801	23144896	Fuse, 2A
F801A	23845691	Clip, Fuse
⚠FS01	23144892	Fuse, 1.6A
FS01A	23845691	Clip, Fuse
K902	23120820	Remote Control Hand Held Unit, CT995
⚠P001	23142622	Aerial Socket
P101	23164099	Phonoplug
P661	23163061	Jack, Earphone
⚠P801	23171814	Cable, Mains
⚠S801	23145601	Switch, Push, 250V, 4A
SA01	23145588	Switch, Push, 1C1P
SA02	23145588	Switch, Push, 1C1P
SA03	23145588	Switch, Push, 1C1P
SA04	23145588	Switch, Push, 1C1P
SA05	23145588	Switch, Push, 1C1P
SA06	23145588	Switch, Push, 1C1P

LOCATION NUMBER	PART NUMBER	DESCRIPTION
SA07	23145588	Switch, Push, 1C1P
⚠V901A	23116495	Socket, CRT, 9P
W201	23250951	Delay Line, TRF2048
W661	23145575	Speaker, 4 inch round, AD44860/X8
W662	23145574	Speaker, 2-1/4 inch round, AD2274/T8
X501	23153962	Crystal, 4.43MHz
X502	23250949	Delay Line, PAL, DL701
XC01	23153924	Crystal, 6MHz
Z101	A5611122	PIF SAW Filter, F1035B
Z201	23107926	Ceramic Video Trap, TCF1012
Z601	23107930	Ceramic Fileter, TCF1008
ZA13	24094832	Capacitor Block, 6800pF×7
ZA15	23153949	Ceramic Resonator, 4MHz, TCR1003
PC BOARD		
U902A	23158266	Main Board, PW4162-1
U902B	23158265	CRT Socket Board, PW4162-2
UA01	23158228	RMT/Selector Board, PW4192
UA02A	23158264	Control Board, PW4163-1
UA02B	23158263	LED Board, PW4163-2
UF01	23158222	Teletext Board, PW4197
UP01	23158254	IR AMP Board, PW4170
PICTURE TUBE		
⚠V901	A5107239	Picture Tube, 510ABU-TC01 (PY), (201T4B)
⚠V901	23112602	Picture Tube, A51-590X, (201T4BA)
TUNER		
H001	23121787	Tuner, UHF, Type 204

DIFFERENT PARTS BETWEEN 201T4BA AND 201T4B

LOCATION NUMBER	201T4BA		201T4B	
	PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
⚠V901	23112602	Picture Tube, A51-590X	A5107239	Picture Tube, 510ABU-TC01 (PY)
R265	24366121	CF, 120 ohm	24366101	CF, 100 ohm
R401	24366181	CF, 180 ohm	24899111	CF, 110 ohm
R540	24366151	CF, 150 ohm	24366181	CF, 180 ohm
R541	24366151	CF, 150 ohm	24366161	CF, 160 ohm
R542	24366151	CF, 150 ohm	24366181	CF, 180 ohm
⚠R920	24000934	FR, 1.6 ohm, 2W	24000945	FR, 1.8 ohm, 2W
U902A	23169657	Main Board, PW4162A-1	23158266	Main Board, PW4162-1
U902B	23169656	CRT Socket Board, PW4162A-2	23158265	CRT Socket Board, PW4162-2

CHASSIS REPLACEMENT PARTS LIST

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 1 OF THIS MANUAL.

CAUTION: The shaded areas and ⚠ marks in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacement is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 1. Do not degrade the safety of the receiver through improper servicing.

NOTICE: *The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.*

Model 221T4B

ABBREVIATIONS: Capacitors..... CD: Ceramic Disk, PF: Plastic Film, EL: Electrolytic,
Resistors..... CF: Carbon Film, CC: Carbon Composition, MF: Metal Film,
OMF: Oxide Metal Film, VR: Variable Resistor, FR: Fusible Resistor.

(All CD and PF capacitors are ±5%, 50V and all resistors, ±5%, 1/6W unless otherwise noted.)

LOCATION NUMBER	PART NUMBER	DESCRIPTION
CAPACITORS		
C01	24636010	EL, 1μF, 50V
C02	24634100	EL, 10μF, 25V
C03	24212102	CD, 1000pF, ±10%
C04	24436331	CD, 330pF
C05	24436470	CD, 47pF
C06	24538104	PF, 0.1μF
C07	24232103	CD, 0.01μF, +80%, −20%
C08	24436470	CD, 47pF
C09	24353160	CD, 16pF
C11	24538104	PF, 0.1μF
C13	24636010	EL, 1μF, 50V
C14	24634100	EL, 10μF, 25V
C15	24593392	PF, 3900pF
C16	24636010	EL, 1μF, 50V
C17	24538104	PF, 0.1μF
C18	24634101	EL, 100μF, 25V
C19	24212102	CD, 1000pF, ±10%
C20	24212102	CD, 1000pF, ±10%
C21	24212102	CD, 1000pF, ±10%
C22	24633101	EL, 100μF, 16V
C32	24212102	CD, 1000pF, ±10%
C33	24436270	CD, 27pF
C101	24212102	CD, 1000pF, ±10%
C102	24212102	CD, 1000pF, ±10%
C103	24232103	CD, 0.01μF, +80%, −20%
C104	24232103	CD, 0.01μF, +80%, −20%
C105	24635479	EL, 4.7μF, 35V
C106	24617969	EL, 0.22μF, 50V
C107	24636100	EL, 10μF, 50V
C108	24232103	CD, 0.01μF, +80%, −20%
C111	24212222	CD, 2200pF, ±10%
C115	24212102	CD, 1000pF, ±10%
C161	24212102	CD, 1000pF, ±10%
C162	24232103	CD, 0.01μF, +80%, −20%
C163	24212102	CD, 1000pF, ±10%
C171	24212102	CD, 1000pF, ±10%

LOCATION NUMBER	PART NUMBER	DESCRIPTION
C172	24212102	CD, 1000pF, ±10%
C174	24436130	CD, 13pF, 50V
C175	24436020	CD, 2pF, ±0.25pF
C176	24436020	CD, 2pF, ±0.25pF
C177	24085031	EL, 1μF, 25V, Nonpolar
C202	24436121	CD, 120pF
C204	24636478	EL, 0.47μF, 50V
C207	24636100	EL, 10μF, 50V
C240	24636010	EL, 1μF, 50V
C242	24636479	EL, 4.7μF, 50V
C301	24636010	EL, 1μF, 50V
C302	24232103	CD, 0.01μF, +80%, −20%
C303	24212561	CD, 560pF, ±10%
C304	24593122	PF, 1200pF
C305	24538333	PF, 0.033μF
C306	24538224	PF, 0.22μF
C307	24212101	CD, 100pF, ±10%
C309	24617981	EL, 2.2μF, 50V
C310	24636478	EL, 0.47μF, 50V
C311	24635331	EL, 330μF
C312	24232103	CD, 0.01μF, +80%, −20%
C313	24635101	EL, 100μF, 35V
C316	24795472	EL, 4700μF
C317	24617996	EL, 3.3μF
C318	24214332	CD, 3300pF, ±10%, 500V
C319	24636478	EL, 0.47μF, 50V
C371	24591682	PF, 6800pF
C401	24867912	PF, 9100pF
C402	24636478	EL, 0.47μF, 50V
C403	24598562	PF, 5600pF
C405	24598302	PF, 3000pF
C406	24636229	EL, 2.2μF, 50V
C407	24636229	EL, 2.2μF, 50V
C408	24635100	EL, 10μF, 35V
C409	24232103	CD, 0.01μF, +80%, −20%
C410	24212152	CD, 1500pF, ±10%
C416	24214271	CD, 270pF, ±10%, 500V

LOCATION NUMBER	PART NUMBER	DESCRIPTION
⚠C440	24095890	CD, 8200pF, 1600V
C442	24828334	PF, 0.33μF, 200V
⚠C444	24442561	CD, 560pF, ±10%, 2kV
C445	24095903	PF, 0.056μF, ±10%, 250V
C447	24644479	EL, 4.7μF, 250V
C448	24633222	EL, 2200μF, 16V
C449	24633471	EL, 470μF, 16V
C450	24828124	PF, 0.12μF, 200V
C463	24212222	CD, 2200pF, ±10%
C501	24436180	CD, 18pF
C502	24436100	CD, 10pF, ±0.25pF
C504	24636010	EL, 1μF, 50V
C506	24232103	CD, 0.01μF, +80%, −20%
C507	24232103	CD, 0.01μF, +80%, −20%
C508	24340160	CD, 16pF, ±10%
C509	24232103	CD, 0.01μF, +80%, −20%
C510	24232103	CD, 0.01μF, +80%, −20%
C511	24232103	CD, 0.01μF, +80%, −20%
C512	24356121	CD, 120pF
C513	24232103	CD, 0.01μF, +80%, −20%
C514	24636478	EL, 0.47μF, 50V
C515	24436200	CD, 20pF
C516	24353330	CD, 33pF
C517	24353680	CD, 68pF
C518	24636479	EL, 4.7μF, 50V
C519	24692223	PF, 0.022μF
C520	24692223	PF, 0.022μF
C523	24530473	PF, 0.047μF, ±10%, 63V
C524	24436270	CD, 27pF
C527	24636100	EL, 10μF, 50V
C531	24212391	CD, 390pF, ±10%
C532	24212391	CD, 390pF, ±10%
C533	24212391	CD, 390pF, ±10%
C601	24436470	CD, 47pF
C602	24436470	CD, 47pF
C603	24232103	CD, 0.01μF, +80%, −20%
C604	24591472	PF, 4700pF
C606	24636010	EL, 1μF, 50V
C608	24636339	EL, 3.3μF, 50V
C609	24636339	EL, 3.3μF, 50V
C617	24353620	CD, 62pF
C619	24636100	EL, 10μF, 50V
C620	24538104	PF, 0.1μF
C621	24636100	EL, 10μF, 50V
C622	24538104	PF, 0.1μF
C623	24538104	PF, 0.1μF
C624	24538123	PF, 0.012μF
C625	24538473	PF, 0.047μF
C626	24636100	EL, 10μF, 50V
C627	24538224	PF, 0.22μF
C628	24636010	EL, 1μF, 50V
C629	24538104	PF, 0.1μF
C630	24633101	EL, 100μF, 16V
C631	24538224	PF, 0.22μF
C632	24636010	EL, 1μF, 50V
C633	24530223	PF, 0.022μF, ±10%, 63V
C635	24436101	CD, 100pF, ±10%
C636	24634102	EL, 1000μF, 25V
C637	24636100	EL, 10μF, 50V
C640	24633101	EL, 100μF, 16V
C641	24436181	CD, 180pF
C643	24636229	EL, 2.2μF, 50V
C662	24602474	PF, 0.47μF
C801	24098999	PF, 0.1μF, ±20%, AC250V

LOCATION NUMBER	PART NUMBER	DESCRIPTION
C803	24094906	CD, 4700pF, +80%, −20%, AC 250V
C804	24094906	CD, 4700pF, +80%, −20%, AC 250V
C805	24094906	CD, 4700pF, +80%, −20%, AC 250V
C806	24094906	CD, 4700pF, +80%, −20%, AC 250V
C810	24086987	EL, 120μF, 400V
C811	24641100	EL, 10μF, 10V
C812	24640972	EL, 33μF, 160V
C813	24211102	CD, 1000pF, ±10%, 2kV
C814	24215102	CD, 1000pF, ±10%, 1kV
C820	24214221	CD, 220pF, ±10%, 500V
C830	24634471	EL, 470μF, 25V
C835	24094916	CD, 4700pF, ±20%, AC400V
C901	24644010	EL, 1μF, 250V
C902	24095512	PF, 4700pF, 1600V
CA01	24636010	EL, 1μF, 50V
CA02	24232103	CD, 0.01μF, +80%, −20%
CA07	24633470	EL, 47μF, 16V
CA11	24436101	CD, 100pF, ±10%
CA12	24436101	CD, 100pF, ±10%
CA13	24232103	CD, 0.01μF, +80%, −20%
CA14	24633470	EL, 47μF, 16V
CA15	24212102	CD, 1000pF, ±10%
CA16	24436221	CD, 220 pF
CA17	24538104	PF, 0.1μF
CA18	24538104	PF, 0.1μF
CA20	24591103	PF, 0.01μF
CA21	24212681	CD, 680pF, ±10%
CA22	24212152	CD, 1500pF, ±10%
CA23	24212102	CD, 1000pF, ±10%
CA24	24212391	CD, 390pF, ±10%
CA25	24633100	EL, 10μF, 16V
CA26	24636010	EL, 1μF, 50V
CA27	24232103	CD, 0.01μF, +80%, −20%
CA28	24232103	CD, 0.01μF, +80%, −20%
CA29	24232103	CD, 0.01μF, +80%, −20%
CB02	24636229	EL, 2.2μF, 50V
CB03	24530104	PF, 0.1μF, ±10%, 63V
CB04	24436390	CD, 39pF
CB05	24353180	CD, 18pF
CB06	24212102	CD, 1000pF, ±10%
CB07	24232103	CD, 0.01μF, +80%, −20%
CB08	24212102	CD, 1000pF, ±10%
CB09	24633330	EL, 33μF, 16V
CB10	24212102	CD, 1000pF, ±10%
CB11	24232103	CD, 0.01μF, +80%, −20%
CF01	24636229	EL, 2.2μF, 50V
CF02	24538104	PF, 0.1μF
CF03	24636010	EL, 1μF, 50V
CF04	24636010	EL, 1μF, 50V
CF05	24636010	EL, 1μF, 50V
CF06	24436271	CD, 270pF
CF07	24436271	CD, 270pF
CF08	24436271	CD, 270pF
CF10	24232103	CD, 0.01μF, +80%, −20%
CF11	24636010	EL, 1μF, 50V
CF13	24636221	EL, 220μF, 50V
CF14	24232103	CD, 0.01μF, +80%, −20%
CK0I	24598222	PF, 0.022μF
CK02	24538683	PF, 0.068μF
CK03	24633100	EL, 10μF, 16V

LOCATION NUMBER	PART NUMBER	DESCRIPTION
CK04	24633330	EL, 33μF, 16V
CK05	24633100	EL, 10μF, 16V
CK06	24633100	EL, 10μF, 16V
CK07	24692222	PF, 2200pF
CR41	24636339	EL, 3.3μF, 50V
CR42	24232103	CD, 0.01μF, +80%, −20%
CR61	24636100	EL, 10μF, 50V
CR62	24232103	CD, 0.01μF, +80%, −20%
CR71	24636339	EL, 3.3μF, 50V
CR72	24232103	CD, 0.01μF, +80%, −20%
CS01	24635471	EL, 470μF, 35V
CS02	24634102	EL, 1000μF, 25V
CS03	24635100	EL, 10μF, 35V
CS04	24635100	EL, 10μF, 35V
CS07	24633470	EL, 47μF, 16V
RESISTORS		
R01	24366104	CF, 100k ohm
R04	24366102	CF, 1k ohm
R05	24366682	CF, 6800 ohm
R06	24366682	CF, 6800 ohm
R07	24366681	CF, 680 ohm
R08	24366152	CF, 1500 ohm
R11	24366122	CF, 1200 ohm
R12	24366122	CF, 1200 ohm
R13	24366122	CF, 1200 ohm
R19	24890682	CF, 6800 ohm, 1/4W
R26	24366102	CF, 1k ohm
R28	24366471	CF, 470 ohm
R29	24366471	CF, 470 ohm
R30	24366471	CF, 470 ohm
R32	24366683	CF, 68k ohm
R35	24366223	CF, 22k ohm
R36	24366223	CF, 22k ohm
R37	24890332	CF, 3300 ohm, 1/4W
R38	24366473	CF, 47k ohm
R39	24366472	CF, 4700 ohm
R101	24890102	CF, 1k ohm, 1/4W
R104	24366683	CF, 68k ohm
R105	24366221	CF, 220 ohm
R107	24366824	CF, 820k ohm
R108	24890392	CF, 3900 ohm, 1/4W
R109	24366224	CF, 220k ohm
R151	24061669	VR, 5k ohm, 1/8W
R152	24061662	VR, 1M ohm, 1/8W
R161	24366181	CF, 180 ohm
R162	24366102	CF, 1k ohm
R163	24366562	CF, 5600 ohm
R164	24366221	CF, 220 ohm
R165	24366681	CF, 680 ohm
R166	24366270	CF, 27 ohm
R171	24890122	CF, 1200 ohm, 1/4W
R172	24366122	CF, 1200 ohm
R201	24366221	CF, 220 ohm
R202	24366152	CF, 1500 ohm
R203	24890162	CF, 1600 ohm, 1/4W
R204	24366102	CF, 1k ohm
R207	24366561	CF, 560 ohm
R209	24366473	CF, 47k ohm
R210	24366162	CF, 1600 ohm
R212	24890103	CF, 10k ohm, 1/4W
R213	24366183	CF, 18k ohm
R214	24366162	CF, 1600 ohm
R215	24890822	CF, 8200 ohm, 1/4W
R218	24890101	CF, 100 ohm, 1/4W

LOCATION NUMBER	PART NUMBER	DESCRIPTION
R220	24890152	CF, 1500 ohm, 1/4W
R230	24366471	CF, 470 ohm
R231	24366101	CF, 100 ohm
R232	24366101	CF, 100 ohm
R240	24366273	CF, 27k ohm
R241	24366154	CF, 150k ohm
R242	24366474	CF, 470k ohm
R243	24366913	CF,91K ohm
R252	24061613	VR, 200 ohm, 1/10W
R253	24061613	VR, 200 ohm, 1/10W
R255	24061610	VR, 2k ohm, 1/10W
R256	24060480	VR, 10k ohm, 0.15W
R257	24063937	VR, 500 ohm, 1/10W
R265	24366101	CF, 100 ohm
R301	24366511	CF, 510 ohm
R302	24366564	CF, 560k ohm
R303	24890564	CF, 560k ohm, 1/4W
R304	24366103	CF, 10k ohm
R306	24366751	CF, 750 ohm
R307	24366563	CF, 56k ohm
R308	24366393	CF, 39k ohm
R309	24366244	CF, 240k ohm
R310	24946825	CC, 8.2M ohm, ±10%, 1/2W
R311	24890393	CF, 39k ohm, 1/4W
R315	24890163	CF, 16k ohm
R316	24366364	CF, 360k ohm
⚠R317	24552102	OMF, 1k ohm, 1/2W
R319	24366202	CF, 2200 ohm
R320	24366102	CF, 1k ohm
⚠R321	24552222	OMF, 2.2k ohm, 1/2W
⚠R322	24553112	OMF, 1.1k ohm, 1W
⚠R323	24983129	OMF, 1.2 ohm, 1W
R324	24890123	CF, 12k ohm, 1/4W
⚠R327	24547759	FR, 7.5 ohm, 1W
R328	24890682	CF, 6800 ohm, 1/4W
R330	24366114	CF, 110k ohm
⚠R331	24552102	OMF, 1k ohm, 1/2W
⚠R332	24552102	OMF, 1k ohm, 1/2W
R333	24366331	CF, 330 ohm
R351	24061664	VR, 200k ohm, 1/8W
R352	24061606	VR, 50k ohm, 1/10W
R381	24366302	CF, 3k ohm
R382	24366103	CF, 10k ohm
R383	24366133	CF, 13k ohm
R384	24366302	CF, 3k ohm
R385	24366512	CF, 5100 ohm
R401	24366121	CF, 120 ohm
R402	24366273	CF, 27k ohm
R403	24366362	CF, 3600 ohm
R404	24890222	CF, 2200 ohm, 1/4W
R405	24366363	CF, 36k ohm
R406	24009990	CF, 150k ohm, ±2%, 1/4W
⚠R407	24384682	OMF, 6800 ohm, 3W
R408	24366182	CF, 1800 ohm
⚠R410	24000947	OMF, 15k ohm, ±2%, 1/2W
R411	24890330	CF, 33 ohm, 1/4W
⚠R416	24009992	OMF, 2k ohm, 3W
⚠R420	24553102	OMF, 1k ohm, 1W
⚠R421	24383511	OMF, 510 ohm, 2W
⚠R440	24552103	OMF, 10k ohm, 1/2W
⚠R441	24552103	OMF, 10k ohm, 1/2W
⚠R444	24982109	MF, 1 ohm, 1/2W
⚠R448	24983399	OMF, 3.9 ohm, 1W
R451	24061668	VR, 10k ohm, 1/8W
⚠R461	24552181	OMF, 180 ohm, 1/2W

LOCATION NUMBER	PART NUMBER	DESCRIPTION
R501	24366821	CF, 820 ohm
R502	24890242	CF, 2400 ohm, 1/4W
R504	24366334	CF, 330k ohm
R505	24890103	CF, 10k ohm, 1/4W
R506	24366162	CF, 1600 ohm
R509	24366391	CF, 390 ohm
R510	24366471	CF, 470 ohm
R511	24366153	CF, 15k ohm
R512	24890104	CF, 100k ohm, 1/4W
R514	24366511	CF, 510 ohm
R515	24366821	CF, 820 ohm
R517	24366823	CF, 82k ohm
R518	24366273	CF, 27k ohm
R519	24366273	CF, 27k ohm
R520	24366122	CF, 1200 ohm
R522	24890272	CF, 2700 ohm, 1/4W
R524	24890272	CF, 2700 ohm, 1/4W
R526	24366272	CF, 2700 ohm
R528	24366101	CF, 100 ohm
R529	24366101	CF, 100 ohm
R530	24366101	CF, 100 ohm
⚠R533	24382433	OMF, 43k ohm, 1W
⚠R534	24382433	OMF, 43k ohm, 1W
⚠R535	24382433	OMF, 43k ohm, 1W
R540	24366181	CF, 180 ohm
R541	24366161	CF, 160 ohm
R542	24366181	CF, 180 ohm
R543	24380221	CF, 220 ohm
R544	24380221	CF, 220 ohm
R545	24380221	CF, 220 ohm
R551	24061671	VR, 1k ohm, 1/8W
R552	24061669	VR, 5k ohm, 1/8W
R555	24060480	VR, 10k ohm, 0.15W
R557	24061608	VR, 10k ohm, 1/10W
R558	24061608	VR, 10k ohm, 1/10W
R559	24061608	VR, 10k ohm, 1/10W
R561	24890472	CF, 4700 ohm, 1/4W
⚠R591	24009974	OMF, 15k ohm, 2W
⚠R592	24009974	OMF, 15k ohm, 2W
⚠R593	24009974	OMF, 15k ohm, 2W
R602	24366222	CF, 2200 ohm
R603	24366103	CF, 10k ohm
R604	24366104	CF, 100k ohm
R605	24366302	CF, 3k ohm
R606	24366472	CF, 4700 ohm
R611	24366332	CF, 3300 ohm
R612	24366471	CF, 470 ohm
R614	24366102	CF, 1k ohm
R616	24366102	CF, 1k ohm
R617	24366682	CF, 6800 ohm
R618	24366153	CF, 15k ohm
R619	24366103	CF, 10k ohm
R620	24890102	CF, 1k ohm, 1/4W
R621	24366102	CF, 1k ohm
R622	24366102	CF, 1k ohm
⚠R623	24321479	MF, 4.7 ohm
R624	24366334	CF, 330k ohm
R625	24890562	CF, 5600 ohm, 1/4W
R626	24890223	CF, 22k ohm, 1/4W
R636	24366102	CF, 1k ohm
⚠R637	24552471	OMF, 470 ohm, 1/2W
⚠R640	24552331	OMF, 330 ohm, 1/2W
R641	24366104	CF, 100k ohm
R642	24366563	CF, 56k ohm
R643	24366511	CF, 510 ohm

LOCATION NUMBER	PART NUMBER	DESCRIPTION
R649	24890272	CF, 2700 ohm, 1/4W
R651	24060478	VR, 50k ohm, 0.15W
R653	24060420	VR, 10k ohm, 0.15W, CC
R654	24060420	VR, 10k ohm, 0.15W, CC
R659	24061672	VR, 500 ohm, 1/8W
R661	24946101	CC, 100 ohm, ±10%, 1/2W
⚠R801	24007688	Cement, 6.2 ohm, 9W
R811	24942224	CC, 220k ohm, 1/2W
⚠R812	24552301	OMF, 300 ohm, 1/2W
⚠R813	24553300	OMF, 30 ohm, 1W
⚠R814	24982759	MF, 7.5 ohm, 1/2W
R815	24946334	CC, 330k ohm, ±10%, 1/2W
R816	24946334	CC, 330k ohm, ±10%, 1/2W
⚠R817	24553201	OMF, 200 ohm, 1W
R818	24366102	CF, 1k ohm
R819	24942114	CC, 110k ohm, 1/2W
R820	24942114	CC, 110k ohm, 1/2W
R821	24941102	CC, 1k ohm, 1/4W
⚠R831	24321278	OMF, 0.27 ohm, 1/2W
R890	24000918	PTC Thermistor, 18 ohm, 290V
R901	24946152	CC, 1500 ohm, ±10%, 1/2W
R902	24946152	CC, 1500 ohm, ±10%, 1/2W
R903	24946152	CC, 1500 ohm, ±10%, 1/2W
⚠R920	24000945	FR, 1.8 ohm, 2W
R990	24946125	CC, 1.2M ohm, 1/2W
⚠RA01	24383133	OMF, 13k ohm, 2W
RA09	24366332	CF, 3300 ohm
RA11	24366102	CF, 1k ohm
RA12	24366223	CF, 22k ohm
RA13	24366223	CF, 22k ohm
RA14	24366682	CF, 6800 ohm
RA15	24366272	CF, 2700 ohm
RA16	24366153	CF, 15k ohm
RA17	24366153	CF, 15k ohm
RA18	24366153	CF, 15k ohm
RA19	24366153	CF, 15k ohm
RA20	24890153	CF, 15k ohm, 1/4W
RA21	24366391	CF, 390 ohm
RA22	24366391	CF, 390 ohm
RA23	24366391	CF, 390 ohm
RA24	24366391	CF, 390 ohm
RA25	24366391	CF, 390 ohm
RA26	24366391	CF, 390 ohm
RA27	24366391	CF, 390 ohm
RA28	24366102	CF, 1k ohm
RA29	24366102	CF, 1k ohm
RA30	24366102	CF, 1k ohm
RA31	24366102	CF, 1k ohm
RA33	24890102	CF, 1k ohm, 1/4W
RA34	24890104	CF, 100k ohm, 1/4W
RA35	24366103	CF, 10k ohm
RA36	24366472	CF, 4700 ohm
RA37	24366103	CF, 10k ohm
RA38	24366203	CF, 20k ohm
RA39	24366333	CF, 33k ohm
RA40	24366333	CF, 33k ohm
RA41	24366333	CF, 33k ohm
RA42	24890153	CF, 15k ohm, 1/4W
RA43	24366221	CF, 220 ohm
RA44	24366104	CF, 100k ohm
RA45	24366471	CF, 470 ohm
RA46	24366471	CF, 470 ohm
RA47	24890471	CF, 470 ohm, 1/4W
RA48	24366391	CF, 390 ohm

LOCATION NUMBER	PART NUMBER	DESCRIPTION
RA49	24890102	CF, 1k ohm, 1/4W
RA60	24890102	CF, 1k ohm, 1/4W
RA61	24890222	CF, 2200 ohm, 1/4W
RA62	24890222	CF, 2200 ohm, 1/4W
RA63	24890154	CF, 150k ohm, 1/4W
RA64	24366472	CF, 4700 ohm
RA65	24366562	CF, 5600 ohm
RA66	24366103	CF, 10k ohm
RA69	24366103	CF, 10k ohm
RA71	24366224	CF, 220k ohm
RA72	24366224	CF, 220k ohm
RA74	24366224	CF, 220k ohm
RA75	24366224	CF, 220k ohm
RA76	24366434	CF, 430k ohm
RA77	24366103	CF, 10k ohm
RA79	24366243	CF, 24k ohm
RA80	24366753	CF, 75k ohm
RA81	24366105	CF, 1000k ohm
RA82	24366563	CF, 56k ohm
RA83	24366563	CF, 56k ohm
RA84	24366105	CF, 1000k ohm
RA85	24366562	CF, 5600 ohm
RA87	24890183	CF, 18k ohm, 1/4W
RA88	24890222	CF, 2200 ohm, 1/4W
RA89	24366434	CF, 430k ohm
RA91	24890391	CF, 390 ohm, 1/4W
RA92	24890391	CF, 390 ohm, 1/4W
RB02	24366471	CF, 470 ohm
RB04	24366471	CF, 470 ohm
RB05	24366272	CF, 2700 ohm
⚠RB06	24552560	OMF, 56 ohm, 1/2W
RB07	24366150	CF, 15 ohm
RB08	24366331	CF, 330 ohm
RF01	24366392	CF, 3900 ohm
RF02	24366682	CF, 6800 ohm
RF03	24366272	CF, 2700 ohm
RF04	24366272	CF, 2700 ohm
RF05	24366272	CF, 2700 ohm
RF07	24366272	CF, 2700 ohm
RF08	24366272	CF, 2700 ohm
RF12	24366222	CF, 2200 ohm
RF13	24366222	CF, 2200 ohm
RF14	24366222	CF, 2200 ohm
RF16	24366122	CF, 1200 ohm
RF17	24366122	CF, 1200 ohm
RF18	24366122	CF, 1200 ohm
RF20	24890121	CF, 1k ohm, 1/4W
RF21	24890121	CF, 1k ohm, 1/4W
RF22	24890121	CF, 1k ohm, 1/4W
RF23	24890103	CF, 10k ohm, 1/4W
RF24	24366221	CF, 220 ohm
RF25	24366271	CF, 270 ohm
RF26	24366271	CF, 270 ohm
RF27	24366271	CF, 270 ohm
RF28	24552241	PF, 240 ohm, 1/2W
RF29	24366562	CF, 5600 ohm
RF30	24366222	CF, 2200 ohm
RF31	24366222	CF, 2200 ohm
RF32	24890103	CF, 10k ohm, 1/4W
RF33	24890103	CF, 10k ohm, 1/4W
RF34	24890103	CF, 10k ohm, 1/4W
RF37	24366272	CF, 2700 ohm
RF38	24366103	CF, 10k ohm
RF39	24366562	CF, 5600 ohm
RF40	24366221	CF, 220 ohm

LOCATION NUMBER	PART NUMBER	DESCRIPTION
RF41	24890101	CF, 100 ohm, 1/4W
⚠RF42	24552680	OMF, 68 ohm, 1/2W
RF55	24061608	VR, 10k ohm, 1/10W
RF56	24061608	VR, 10k ohm, 1/10W
RF57	24061608	VR, 10k ohm, 1/10W
RK01	24366223	CF, 22k ohm
RK02	24366103	CF, 10k ohm
RK03	24366220	CF, 22 ohm
RK04	24366222	CF, 2200 ohm
RR43	24366123	CF, 12k ohm
RR44	24366473	CF, 47k ohm
RR45	24366472	CF, 4700 ohm
RR46	24366563	CF, 56k ohm
RR64	24366122	CF, 1200 ohm
RR65	24366104	CF, 100k ohm
RR66	24366222	CF, 2200 ohm
RR67	24890222	CF, 2200 ohm, 1/4W
RR73	24366123	CF, 12k ohm
RR74	24366473	CF, 47k ohm
RR75	24366472	CF, 4700 ohm
RR76	24890272	CF, 2700 ohm, 1/4W
⚠RS01	24552511	OMF, 510 ohm, 1/2W
RS02	24366182	CF, 1800 ohm
⚠RS06	24983478	OMF, 0.47 ohm, 1W
RS07	24366102	CF, 1k ohm
COILS & TRANSFORMERS		
L02	23262826	Coil, TRF1067
L03	23238920	Coil, Peaking, TRF4150AC
L102	23262855	Coil, PIF, TRF1453
L103	23262881	Coil, AFT, TRF1445
L105	23237990	Coil, Peaking, TRF4569AC
L106	23261051	Coil, Choke, AZ9246E
L161	23262951	Coil, TRF1019
L162	23261985	Coil, RF Choke, TRF9221
L171	23262881	Coil, AFT, TRF1445
L201	23237987	Coil, Peaking, TRF4100AC
L410	23221026	Coil, Choke, AZ9004Y
L411	23222673	Coil, H. Linearity, AT4042/30
L501	23237981	Coil, Peaking, TRF4330AC
L502	23237987	Coil, Peaking, TRF4100AC
L503	23237911	Coil, peaking, TRF4201AC
L551	23250972	Coil, 1H-DL Matching, TRF5418
L552	23250972	Coil, 1H-DL Matching, TRF5418
L601	23237986	Coil, Peaking, TRF4120AC
L602	23252198	Coil, SIF, TRF6702
L811	23261975	Coil, Choke, TRF9229
⚠L901	23209998	Coil, Degaussing, Type 94380
⚠L902	23209998	Coil, Degaussing, Type 94380
LA11	23237999	Coil, Peaking, TRF4109AC
LB01	23262842	Coil, PIF
LK01	23232963	Coil, TRF3055
LK02	23232963	Coil, TRF3055
⚠T401	23224988	Transformer, Horiz Drive, TLN1032
⚠T461	23226423	Transformer, Horiz Output, TFB4023AD
T801	23211970	Transformer, Line Filter, TRF3110
⚠T802	23213813	Transformer, Converter, TPW3050
⚠T803	23213808	Transformer, Power, TPW1282
SEMICONDUCTORS		
IC01	23119519	IC, SAA5020

LOCATION NUMBER		PART NUMBER	DESCRIPTION
IC02		23119518	IC, SAA5030
IC03		23119517	IC, SAA5040B
IC04		23119516	IC, SAA5050
IC06		23119515	IC, N74LS83AN
IC07		23119514	IC, N74LS161N
IC08		23119514	IC, N74LS161N
IC09		B0423144	IC, TMM314APL
IC09	or	23119499	IC, SBB2114
IC09	or	23119498	IC, SBB2114L
IC09	or	23119497	IC, μPD2114LC
IC09	or	23119482	IC, TMS2114
IC09	or	23119446	IC, TMM2114AP-12
IC09	or	23119444	IC, TMM2114AP-15
IC10		B0423144	IC, TMM314APL
IC10	or	23119499	IC, SBB2114
IC10	or	23119498	IC, SBB2114L
IC10	or	23119497	IC, μPD2114LC
IC10	or	23119482	IC, TMS2114
IC10	or	23119446	IC, TMM2114AP-12
IC10	or	23119444	IC, TMM2114AP-15
IC11		23119513	IC, N74LS02N
IC12		B0470116	IC, TC4011BP
IC101		B0356804	IC, TA7680AP
IC303		23119533	IC, TDA3651A
IC501		B0357050	IC, TA7699AP
IC620		23119458	IC, TD1524A
IC621		23119532	IC, TDA1015
ICA11		B0406818	IC, TMP47C432N-8884
ICA12		B0428420	IC, TMM842P
ICA13		B0349250	IC, TA75393S
ICF01		23119723	IC, AN5352
ICK01		23119566	IC, μPC1474HA
Q13		A6317547	Transistor, 2SC1815-Y
Q14		23114689	Transistor, BC547A
Q161		23114690	Transistor, BF199
Q201		23114689	Transistor, BC547A
Q302		23114691	Transistor, BC557A
Q371		23114632	Transistor, BC547B
Q372		23114632	Transistor, BC547B
Q402		A6330004	Transistor, 2SC2482 FA-1
⚠Q404		A6868702	Transistor, 2SD1427
Q505		23114693	Transistor, BF871
Q506		A6330000	Transistor, 2SC2482
Q507		23114693	Transistor, BF871
Q508		A6330000	Transistor, 2SC2482
Q509		23114693	Transistor, BF871
Q510		A6330000	Transistor, 2SC2482
Q611		23114691	Transistor, BC557A
Q622		23114689	Transistor, BC547A
Q640		23114689	Transistor, BC547A
⚠Q801		23114568	Transistor, STR5412
Q802		A6328330	Transistor, 2SC2383-Y
Q802	or	A6328320	Transistor, 2SC2383-O
Q803		23114689	Transistor, BC547A
QA02		23114691	Transistor, BC557A
QA14		23114691	Transistor, BC557A
QA15		23114691	Transistor, BC557A
QA16		23114689	Transistor, BC547A
QA18		A6048371	Transistor (FET), 2SK30ATM-GR
QA19		23114689	Transistor, BC547A
QB01		23114687	Transistor, BF324
QF02		23114691	Transistor, BC557A
QF03		23114691	Transistor, BC557A
QF04		23114691	Transistor, BC557A

LOCATION NUMBER	PART NUMBER	DESCRIPTION
QF05	23114689	Transistor, BC547A
QF06	23114689	Transistor, BC547A
QF07	23114688	Transistor, BC327
QF08	23114689	Transistor, BC547A
QR41	23114689	Transistor, BC547A
QR42	23114691	Transistor, BC557A
QR62	23114546	Transistor, BC557B
QR71	23114689	Transistor, BC547A
QR72	23114691	Transistor, BC557A
QS01	23114674	Transistor, BDT31A
QS02	A6625170	Transistor, 2SB686-0
QS03	23114689	Transistor, BC547A
QS04	23114691	Transistor, BC557A
D01	23115599	Diode, 1N4148
D02	23115599	Diode, 1N4148
D03	23115599	Diode, 1N4148
D04	23115599	Diode, 1N4148
D202	23115599	Diode, 1N4148
D203	23115599	Diode, 1N4148
D204	23115599	Diode, 1N4148
D205	23115599	Diode, 1N4148
D241	23115599	Diode, 1N4148
D242	23115599	Diode, 1N4148
D243	A7150041	Diode, 1SS104
D244	23115599	Diode, 1N4148
D301	23115599	Diode, 1N4148
D302	23115599	Diode, 1N4148
D305	23115599	Diode, 1N4148
D309	23115599	Diode, 1N4148
D371	23115599	Diode, 1N4148
D406	23115599	Diode, 1N4148
D408	23115599	Diode, 1N4148
D415	23115599	Diode, 1N4148
D591	23115599	Diode, 1N4148
D592	23115599	Diode, 1N4148
D593	23115599	Diode, 1N4148
⚠D640	A8641942	Photo Coupler, TLP631
D641	23118984	Diode, Zener, ZPD9.1
D644	23115599	Diode, 1N4148
D801	A7568410	Diode, TVR-4J
D802	A7568410	Diode, TVR-4J
D803	A7568410	Diode, TVR-4J
D804	A7568410	Diode, TVR-4J
⚠D806	23115523	Diode, SR-2M
D807	23115530	Diode, RG2
D808	23115596	Diode, BYV95C
D809	23115596	Diode, BYV95C
D830	23115596	Diode, BYV95C
DA05	23115878	Diode, Zener, μPC574JC
DA06	23115599	Diode, 1N4148
DA11	23115599	Diode, 1N4148
DA12	23115599	Diode, 1N4148
DA13	23115599	Diode, 1N4148
DA14	23115599	Diode, 1N4148
DA15	23115599	Diode, 1N4148
DA16	23115599	Diode, 1N4148
DA17	23115599	Diode, 1N4148
DA18	23115599	Diode, 1N4148
DA19	23115599	Diode, 1N4148
DA91	23118971	Diode (LED), MAN6410, DISPLAY
DF01	23115599	Diode, 1N4148
DF02	23115599	Diode, 1N4148
DF03	23115599	Diode, 1N4148
DF04	23115599	Diode, 1N4148

LOCATION NUMBER	PART NUMBER	DESCRIPTION
DF05	23115599	Diode, 1N4148
DF06	23115599	Diode, 1N4148
DK01	23115594	Diode, SFH205, I.R. Sensor
DR41	23115599	Diode, 1N4148
DR71	23115599	Diode, 1N4148
DR90	23118969	Diode (LED), MV57124, Red
DS01	23115593	Diode, 1N4002
DS02	23115593	Diode, 1N4002
DS03	23115593	Diode, 1N4002
DS04	23115593	Diode, 1N4002
DS05	23115593	Diode, 1N4002
DS06	23115593	Diode, 1N4002
DS07	23115593	Diode, 1N4002
DS08	23115593	Diode, 1N4002
DS09	23115525	Diode, Zener, BZX79B12
DS10	23115526	Diode, Zener, BZX79B5V1
MISCELLANEOUS		
E505	23198898	CRT Wire Assembly A
⚠E512	23134987	Rim Band Insulator
⚠F801	23144896	Fuse, 2A
F801A	23845691	Clip, Fuse
⚠FS01	23144892	Fuse, 1.6A
FS01A	23845691	Clip, Fuse
K902	23120820	Remote Control Hand Held Unit, CT995
⚠P001	23142622	Aerial Socket
P101	23164099	Phonoplug
P661	23168941	Jack, Headphone
P661A	23163323	Nut, Headphone Jack
⚠P801	23171814	Cable, Mains
⚠S801	23145601	Switch, Push, 250V, 4A
SA01	23145588	Switch, Push, 1C1P
SA02	23145588	Switch, Push, 1C1P
SA03	23145588	Switch, Push, 1C1P

LOCATION NUMBER	PART NUMBER	DESCRIPTION
SA04	23145588	Switch, Push, 1C1P
SA05	23145588	Switch, Push, 1C1P
SA06	23145588	Switch, Push, 1C1P
SA07	23145588	Switch, Push, 1C1P
⚠V901A	23116495	Socket, CRT, 9P
W201	23250951	Delay Line, TRF2048
W661	23145575	Speaker, 4 inch round, AD44860/X8
W662	23145574	Speaker, 2-1/4 inch round, AD2274/T8
X501	23153962	Crystal, 4.43MHz
X502	23250949	Delay Line, PAL, DL701
XC01	23153924	Crystal, 6MHz
Z101	A5611122	PIF SAW Filter, F1035B
Z201	23107926	Ceramic Video Trap, TCF1012
Z601	23107930	Ceramic Fileter, TCF1008
ZA13	24094832	Capacitor Block, 6800pF×7
ZA15	23153949	Ceramic Resonator, 4MHz, TCR1003
PC BOARD		
U902A	23158010	Main Board, PW4325-1
U902B	23158009	CRT Socket Board, PW4325-2
UA01	23158228	RMT/Selector Board, PW4192
UA02A	23158073	Control Board, PW4298-1
UA02B	23158072	LED Board, PW4298-2
UA02C	23158071	Headphone Board, PW4298-3
UF01	23158222	Teletext Board, PW4197
UP01	23158254	IR AMP Board, PW4170
PICTURE TUBE		
⚠V901	A5335350	Picture Tube, 560DYB22-TC03
TUNER		
H001	23121787	Tuner, UHF, Type 204

201T4B:221T4B

IMPORTANT SAFETY NOTE:

Components marked with the International Hazard Symbol: ⚠ and shaded must, if changed, be replaced by an approved type and must be mounted as the original. This will ensure that the safety standards adhered to during manufacture will be maintained following any servicing procedure.

OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltage readings were obtained using a high impedance digital voltmeter.
2. (—) or ground lead of instruments should be connected to the ground marked (⊥) in the schematic on checking Non-isolated circuit but should be connected to the points marked (⏚) on checking isolated circuit surrounded by mark - - - -
3. The voltage readings may vary as much as ±20%.
4. Check that the Tuning, A.F.C., Brightness, Contrast and Colour controls are adjusted for the best picture, making sure that the Contrast and Colour controls are set near to their mid-positions and the Brightness control is set nearly at maximum.
5. The waveforms were taken using a standard colour bar signal and were observed using a wide band oscilloscope via a low capacity probe.

NOTES:

1. This circuit diagram is subject to change without notice.

EXPRESSION

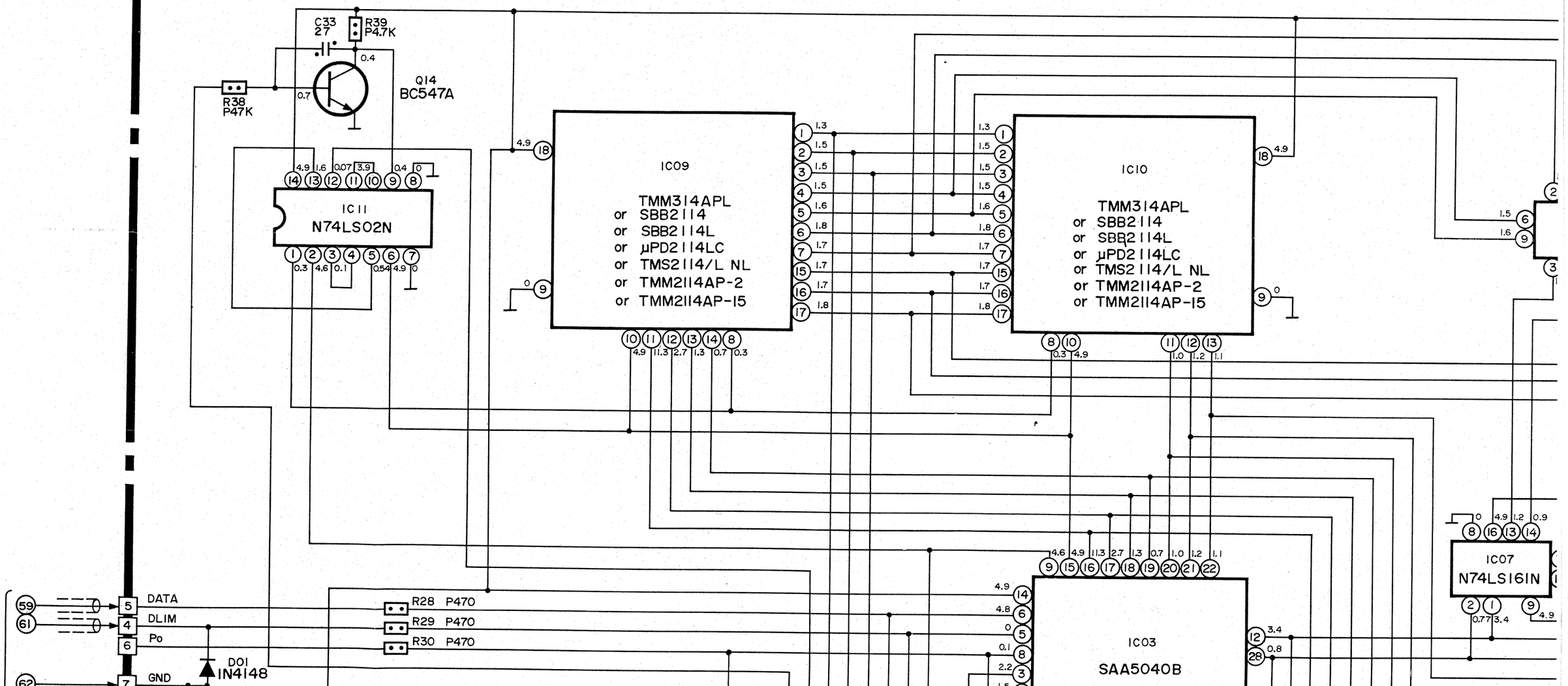
VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less tl μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more t μH, and the values less than 1 in H.

GROUNDING SYMBOL

1. ⊥: Non isolated ground, ⏚ : Isolated ground.

UF01 TELETEXT BOARD PW4197



FROM MAIN BOARD

59 DATA
61 DLIM
6 Po
62 GND
7
2
65 +12V(RMT/SEL)
1
64 +5V
3

D01 IN4148
C17 0.1
C18 100µ (25V)
D02 IN4148
C22 100µ (16V)
D03 IN4148

R28 P470
R29 P470
R30 P470

L03 PL-15
C07 0.01
C08 47
C09 16(CH)

FROM MAIN BOARD

44 VIDEO IN
45 GND
21
22
20

C06 0.1
C02 10µ (25V)
R01 P100K
XC01 6MHz
C14 10µ (25V)
R04 P1K
C13 1µ (50V)
R05 P6.8K
R06 P6.8K

C01 1µ (50V)
D04 IN4148
C03 1000

IC02
SAA5030

C04 330
C05 47
C32 1000
L02
C11 0.1
C15 0.0039
C16 1µ (50V)
R11 P1.2K
R07 P680
R08 P1.5K
R12 P1.2K
R13 P1.2K
C19 1000

IC03
SAA5040B

R32 P68K
C21 1000
C20 1000
R19 P6.8K

IC01
SAA5020

IC07
N74LS161N

IC04
SAA5050

IC12
TC4011BP

ct to change without notice.

OR and INDUCTOR

,000, M=1,000,000.
matic, all capacitor values less than 1 are expressed in
n pF.
matic, all inductor values more than 1 are expressed in
H.

solated ground.

RESISTORS

Prefixed to values:

TYPE	MARK
Carbon Comp.	S
Oxide Metal Film	R
Ins. Carbon Film	P
Wire Wound	W
Cement covered W.W.	NO MARK
Fusible Res.	FR

Suffixes to values:

TOLERANCE	MARK
±1%	(F)
±2%	(G)

Suffixes to VR values:

LAW	MARK
Linear	(B)
'C' Curve Characteristic	(C)

Rating Markings:

WATTAGE	MARK
1/16W	
1/4W	
1/2W	
1W	1
2W	2

WATTAGE	MARK
3W	3
5W	5
10W	10
15W	15
20W	20
25W	25

CAPACITORS

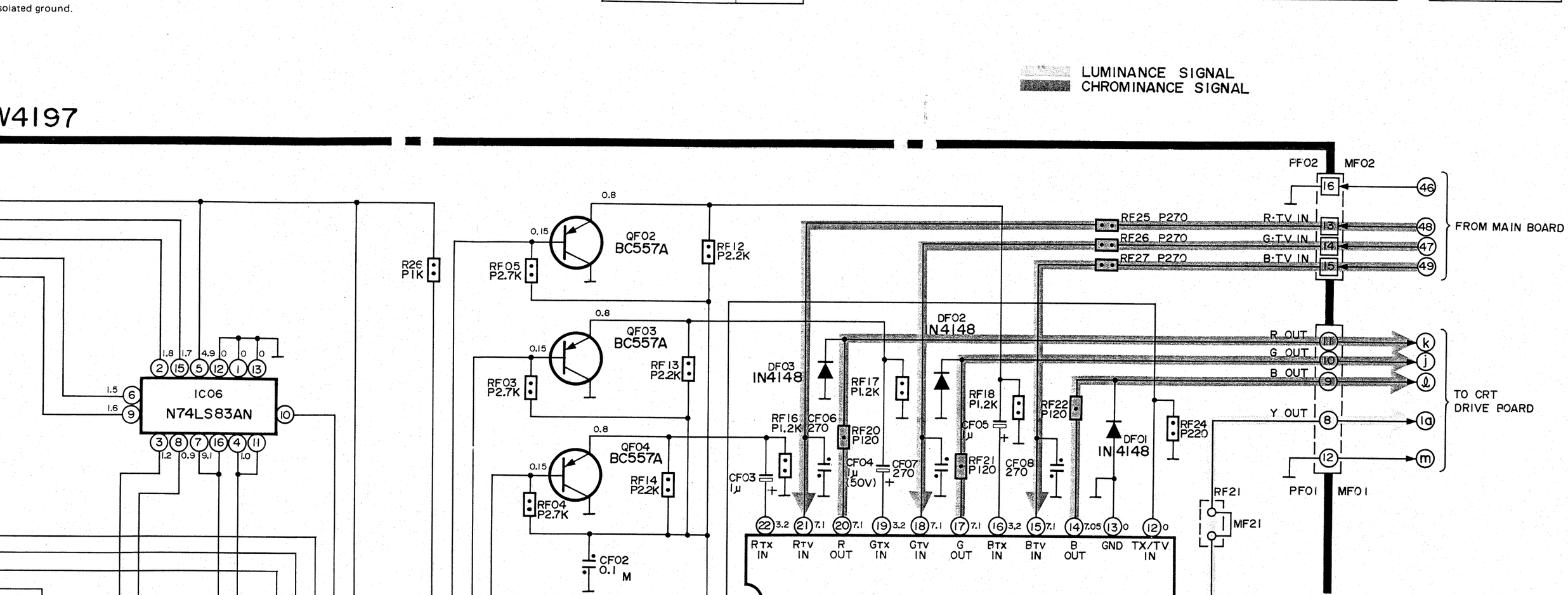
Rating Markings:

VOLTAGE	MARK
6.3V	
10V	
16V	
25V	
35V	
50V	

VOLTAGE	MARK
160V ~ 350V	
350V ~ 630V	
2.5kV	
Electro.	
Non Polar.	

W4197

LUMINANCE SIGNAL
CHROMINANCE SIGNAL



IC07
N74LS161N

IC08
N74LS161N

IC04
SAA5050

ICF01
AN5352
RTX IN | RTV IN | R OUT | GTX IN | GTV IN | G OUT | BTX IN | BTV IN | B OUT | GND | TX/TV IN
Vcc | FILTER | CONTRAST CONTROL | BLK. PULSE IN | CLAMP PULSE IN | R ADJ | B ADJ | BRT CONTROL | Y OUT | YTV IN

QF04 BC557A
QF05 BC547A
QF06 BC547A
QF07 BC327
QF08 BC547A
Q13 2SC1815-Y

DF04 IN4148
DF05 0A91
DF06 IN4148

RF02 P6.8K
RF04 P2.7K
RF07 P2.7K
RF08 P2.7K
RF14 P2.2K
RF21 P3.9K
RF21 P120
RF22
RF23 P10K
RF28 R240
RF29 P5.6K
RF30 P2.2K
RF31 P2.2K
RF32 P10K
RF33 P10K
RF34 P10K
RF35 P22K
RF36 P22K
RF37 P2.7K
RF38 P10K
RF39 P5.6K
RF40 P220
RF41 100
RF42 R68
RF43 P8.2K
RF55 10K(B)
RF56 10K(B)
RF57 10K(B)
R37 P3.3K

CF01 2.2μ (50V)
CF02 0.1 M
CF03 1μ
CF04 1μ (50V)
CF07 270
CF08 270
CF10 0.01
CF11 1μ (50V)
CF13 220μ (50V)
CF14 0.01

MF21
MF22

PF01 MF01
PF03(1/2) MF03(1/2)
PF04 MF04

+12V (MAIN)
Y-TV IN
BLK IN

FROM MAIN BOARD

201T4B

IMPORTANT SAFETY NOTE:
Components marked with the International Hazard Symbol: ⚠ and shaded must, if changed, be replaced by an approved type and must be mounted as the original. This will ensure that the safety standards adhered to during manufacture will be maintained following any servicing procedure.

RESISTORS

Prefixed to values:

TYPE	MARK
Carbon Comp.	S
Oxide Metal Film	R
Ins. Carbon Film	P
Wire Wound	W
Cement covered W.W.	NO MARK
Fusible Res.	FR

Suffixes to values:

TOLERANCE	MARK
±1%	(F)
±2%	(G)

Suffixes to VR values:

LAW	MARK
Linear	(B)
'C' Curve Characteristic	(C)

Rating Markings:

WATTAGE	MARK
1/16W	
1/4W	
1/2W	
1W	1
2W	2

WATTAGE	MARK
3W	3
5W	5
10W	10
15W	15
20W	20
25W	25

OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltage readings were obtained using a high impedance digital voltmeter.
2. (—) or ground lead of instruments should be connected to the ground marked (⏚) in the schematic on checking Non-isolated circuit but should be connected to the points marked (⏚) on checking isolated circuit surrounded by mark - - - -
3. The voltage readings may vary as much as ±20%.
4. Check that the Tuning, A.F.C., Brightness, Contrast and Colour controls are adjusted for the best picture, making sure that the Contrast and Colour controls are set near to their mid-positions and the Brightness control is set nearly at maximum.
5. The waveforms were taken using a standard colour bar signal and were observed using a wide band oscilloscope via a low capacity probe.

CAPACITORS

Rating Markings:

VOLTAGE	MARK
6.3V	
10V	
16V	
25V	
35V	
50V	

VOLTAGE	MARK
160V ~ 350V	
350V ~ 630V	
2.5kV	
Electro.	
Non Polar.	

NOTES:

1. This circuit diagram

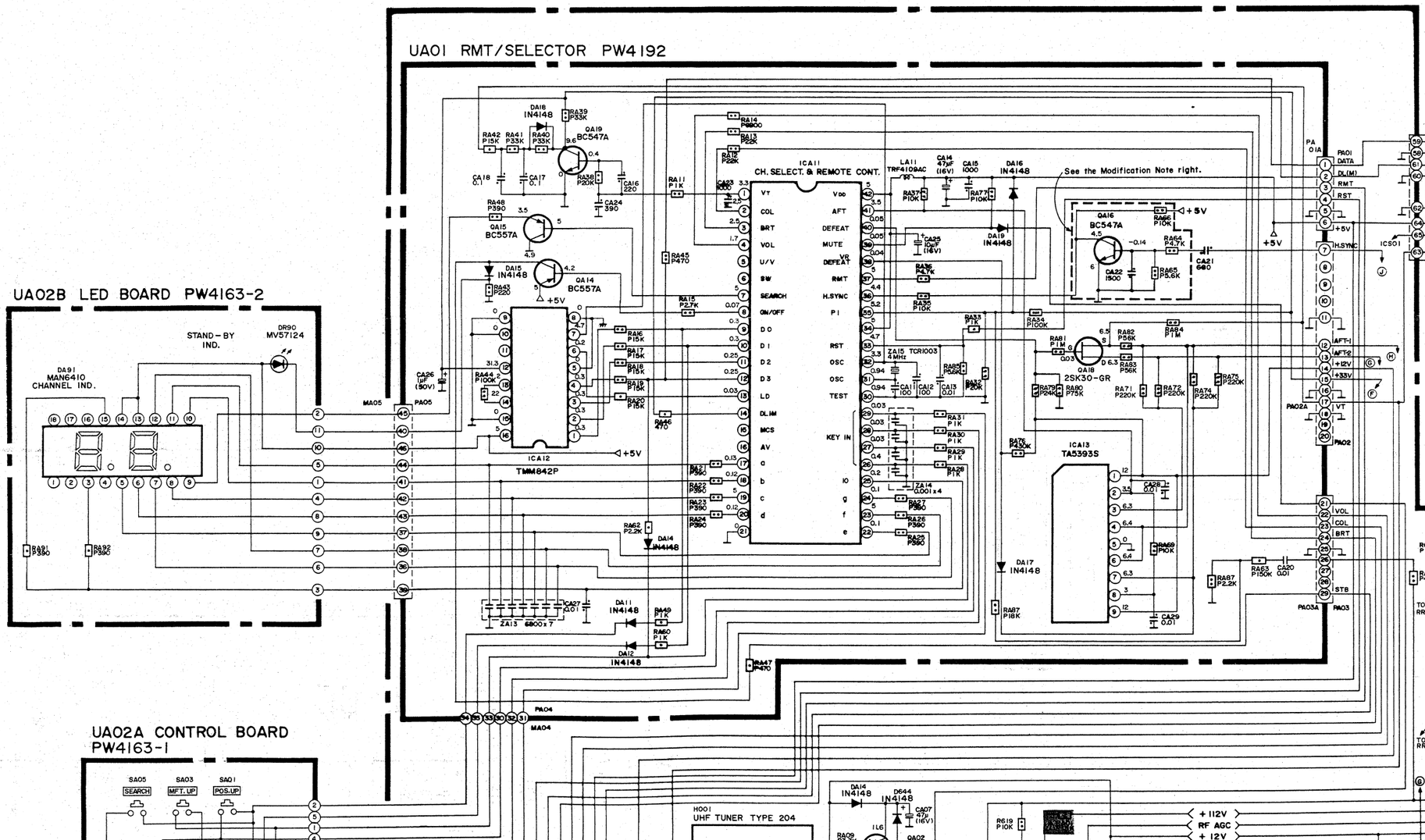
EXPRESSION

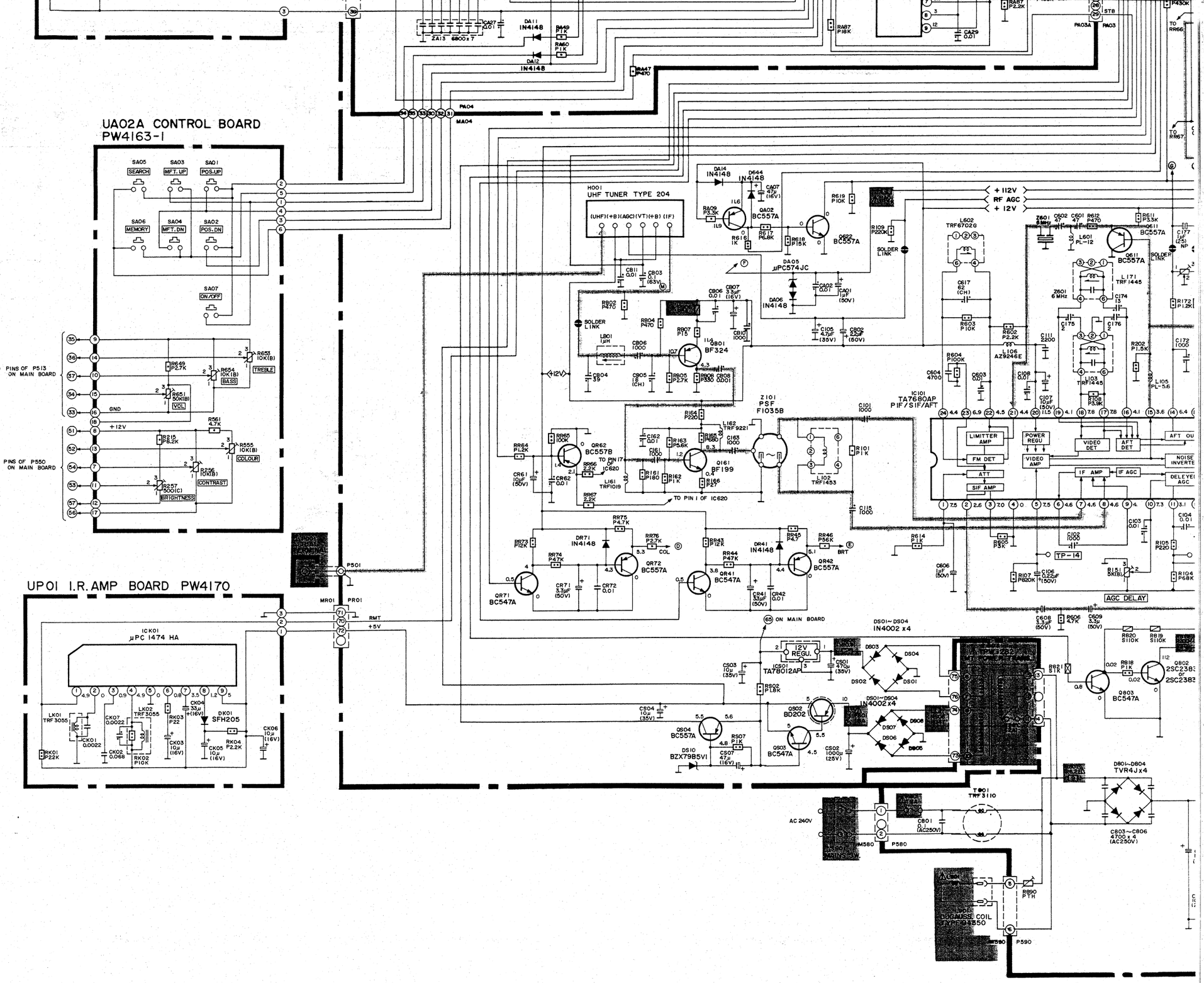
VALUE OF RESISTOR

1. Resistance is shown i
2. Unless otherwise no µF and the values m
3. Unless otherwise no µH, and the values le

GROUNDING SYMBOL

1. ⊥: Non isolated grou




UA02A CONTROL BOARD
PW4163-1
SA05 SEARCH
SA03 MFT. UP
SA01 POS. UP
SA06 MEMORY
SA04 MFT. DN
SA02 POS. DN
SA07 ON/OFF
TO PINS OF P513 ON MAIN BOARD
TO PINS OF P550 ON MAIN BOARD
R653 10K(B) TREBLE
R654 10K(B) BASS
R651 50K(B) VOL
R561 4.7K
R555 10K(B) COLOUR
R556 10K(B) CONTRAST
R557 500(C) BRIGHTNESS
GND
+12V
P501
UP01 I.R. AMP BOARD PW4170
IC K01 μPC 1474 HA
LK01 TRF 3055
LK02 TRF 3055
DK01 SFH205
RMT
+5V
H001 UHF TUNER TYPE 204
(UHF)(+B)(AGC)(VT)(+B) (IF)
DA05 μPC574JC
DA06 IN4148
DA14 IN4148
D644 IN4148
Q602 BC557A
Q622 BC557A
Q611 BC557A
Q801 BF324
Z101 PSF F1035B
IC101 TA7680AP PIF/SIF/AFT
LIMITTER AMP
FM DET
ATT
SIF AMP
POWER REGU
VIDEO AMP
VIDEO DET
AFT DET
IF AMP
IF AGC
AGC DELAY
TP-14
Q161 BF199
QR62 BC557B
QR71 BC547A
QR72 BC557A
QR41 BC547A
QR42 BC557A
DR71 IN4148
DR41 IN4148
L602 TRF6702G
L601 PL-12
L171 TRF1445
L103 TRF1445
L105 PL-5.6
L106 AZ9246E
L161 TRF1019
L162 TRF9221
L102 TRF1453
+112V
RF AGC
+12V
ON MAIN BOARD
DS01~DS04 IN4002 x4
IC501 TA78012AP 12V REGU.
Q502 BD202
Q503 BC547A
Q504 BC557A
DS10 BZX79B5V1
Q802 2SC2383 or 2SC2383
Q803 BC547A
D801~D804 TVR4Jx4
T801 TRF3110
AC 240V
C803~C806 4700 x 4 (AC250V)
DEGAUSSE COIL
P580
P590

NOTES:

1. This circuit diagram is subject to change without notice.

EXPRESSION

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

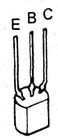
1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.

GROUNDING SYMBOL

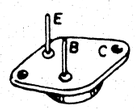
1. ⊥: Non isolated ground, ⏚ : Isolated ground.

TERMINAL VIEW OF TRANSISTOR

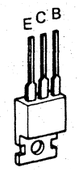
① BC327
BC547A
BC557A
BF324



② 2SD820
2SD870

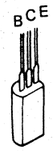


③ 2SC2073



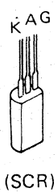
④ 2SC2068
BF871

⑤ 2SA966
2SC2482



⑥ 2SK30ATM

⑦ SFOR1B41



(SCR)

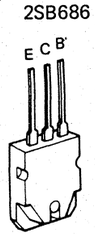
⑧ BD233-16

Type name printed

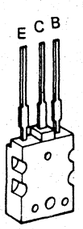
⑨ 2SC1959

⑩ BF199

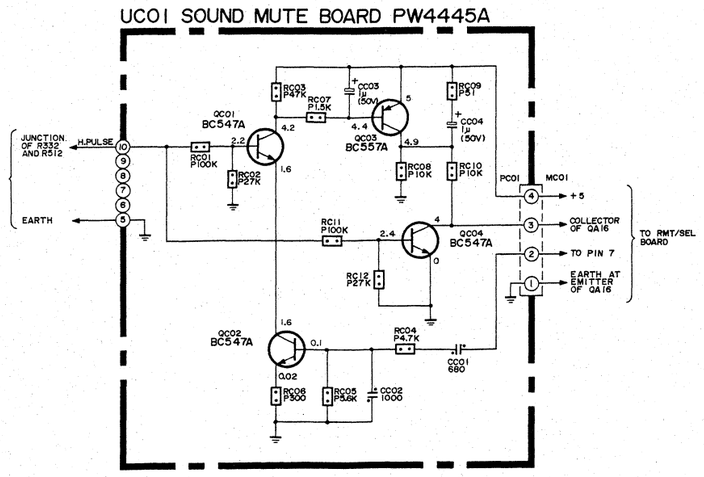
⑪ 2SD716
2SB686

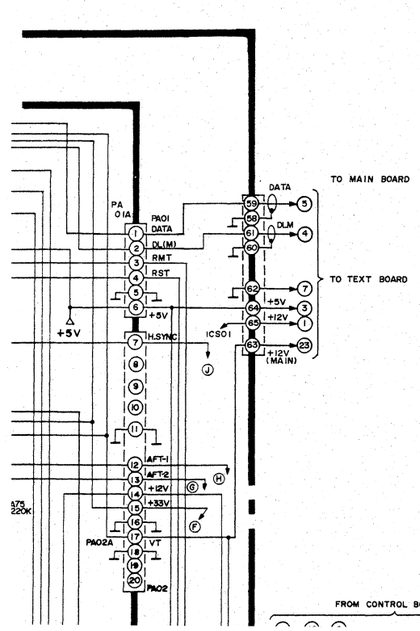


⑫ 2SD1427



UC01 SOUND MUTE BOARD PW4445A





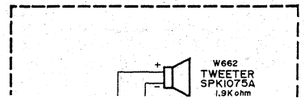
MODIFICATION NOTE:

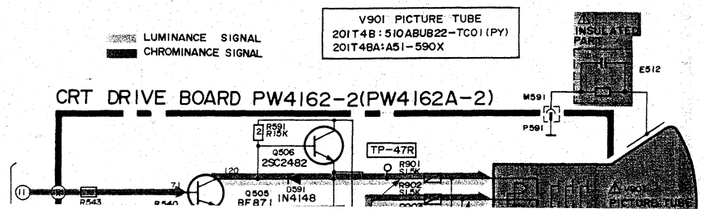
The following modifications are made for the improvement of ICA11.
Check the type name of ICA11 when servicing.

	Before Modification	After Modification
ICA11	IC, TMP47C432N-8867	IC, TMP47C432N-8884
UC01	Sound Mute Board Assembly, PW4445A	None
QA16	None	Transistor, BC547A
CA21	None	CD, 680PF
CA22	None	CD, 1500PF
RA64	None	CF, 4.7 k ohm, 1/6W
RA65	None	CF, 5.6 k ohm, 1/6W
RA66	None	CF, 10 k ohm, 1/6W
MC01	Connector, 4P	None

DIFFERENCES BETWEEN 201T4B AND 201T4BA

Location No.	201T4B	201T4BA
V901	510ABUB22-TC01 (PY)	A51-590X
U902A	Main Board PW4162-1	Main Board PW4162A-1
U902B	CRT Socket Board PW4162-2	CRT Socket Board PW4162A-2
R265	CF, 100 ohm, 1/6W	CF, 120 ohm, 1/6W
R410	CF, 160 ohm, 1/6W	CF, 180 ohm, 1/6W
R540	CF, 180 ohm, 1/6W	CF, 150 ohm, 1/6W
R541	CF, 160 ohm, 1/6W	CF, 150 ohm, 1/6W
R542	CF, 180 ohm, 1/6W	CF, 150 ohm, 1/6W
R920	FR, 1.8 ohm, 2W	FR, 1.6 ohm, 2W





U902A MAIN BOARD PW4162-1(PW4162A-1)

FROM CONTROL BOARD

IC620 TDA1524A SOUND CONTROL

TREBLE

BASS

VOL

VCC

+13.5V

+12V

ISOLATED PART

IC621 TDA 1015 AUDIO OUT.

POWER AMP

PRE AMP.

W662 TWEETER SPK1075A 1.9K ohm

W661 WOOFER AD44860/T8 8 ohm

P661 EARPHONE JACK

TO RR66

TO RR67

TO TEXT BOARD

TO CONTROL BOARD

IC501 TA7699AP VIDEO/CHROMA/DEF

CLAMP IN

BRT CONT.

CHROMA IN

ACC DET

COLOUR CONT.

CHROMA OUT

BURST OUT

S.S GND

OSC

DIRECT

APC DET

R-Y OUT

B-Y OUT

ACC AMP

GAIN CONTROL

BURST GATE

K/I DET

V C C

F F

DEMOD

MATRIX

IH AMP ADJ.

BURST PHASE ADJ.

IH RDL PHASE ADJ.

COLOUR SYNC ADJ.

IH DL DL701

AMP

INVERTER

SYNC. SEP.

PHASE DET.

H. OSC

H. DRIVE

X-RAY

VERT. OSC

V. AMP

V. DRIVE

Y-OUT

B-Y OUT

DRIVER

OUTPUT STAGE

VOLTAGE SOURCE

FLYBACK GENERATOR

IC303 TDA3651A VERTICAL OUT.

HORIZ. DRIVE

VERT. HOLD

HORIZ. HOLD

AFC BALANCE

AGC DELAY

SOLDER LINK

POWER REGU

VIDEO DET

AFT DET

AFT OUT

NOISE INVERTER

VIDEO AMP

IF AMP

IF AGC

DELEYED AGC

TP-14

TP-15

ISOLATED PART

TO AUDIO

D801~D804 TVR4Jx4

C803~C806 4700 x 4 (AC250V)

TO V901

E.H.T.

TP-47R

ORT SOCKET

RED CUT OFF

GRN CUT OFF

BLU CUT OFF

RED DRIVE

GRN DRIVE

BLU DRIVE

RED OUT.

GRN OUT.

BLU OUT

SUB BRIGHT

FROM CONTROL BOARD

+ 180V

GROUND

HEATER

FOCUS

SCREEN

221T4B

IMPORTANT SAFETY NOTE:
Components marked with the International Hazard Symbol: ⚠ and shaded must, if changed, be replaced by an approved type and must be mounted as the original. This will ensure that the safety standards adhered to during manufacture will be maintained following any servicing procedure.

OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltage readings were obtained using a high impedance digital voltmeter.
2. (—) or ground lead of instruments should be connected to the ground marked (⏚) in the schematic on checking Non-isolated circuit but should be connected to the points marked (⏚) on checking isolated circuit surrounded by mark - - - -
3. The voltage readings may vary as much as ±20%.
4. Check that the Tuning, A.F.C., Brightness, Contrast and Colour controls are adjusted for the best picture, making sure that the Contrast and Colour controls are set near to their mid-positions and the Brightness control is set nearly at maximum.
5. The waveforms were taken using a standard colour bar signal and were observed using a wide band oscilloscope via a low capacity probe.

RESISTORS

Prefixed to values:

TYPE	MARK
Carbon Comp.	S
Oxide Metal Film	R
Ins. Carbon Film	P
Wire Wound	W
Cement covered W.W.	NO MARK
Fusible Res.	FR

Suffixes to values:

TOLERANCE	MARK
±1%	(F)
±2%	(G)

Suffixes to VR values:

LAW	MARK
Linear	(B)
'C' Curve Characteristic	(C)

Rating Markings:

WATTAGE	MARK
1/16W	
1/4W	
1/2W	
1W	1
2W	2

WATTAGE	MARK
3W	3
5W	5
10W	10
15W	15
20W	20
25W	25

CAPACITORS

Rating Markings:

VOLTAGE	MARK
6.3V	
10V	
16V	
25V	
35V	
50V	

VOLTAGE	MARK
160V ~ 350V	
350V ~ 630V	
2.5kV	
Electro.	
Non Polar.	

NOTES:

1. This circuit dia

EXPRESSION

VALUE OF RESI

1. Resistance is sl
2. Unless otherw µF and the val
3. Unless otherw µH, and the va

GROUNDING SY

1. ⊥: Non isolatec

UA01 RMT/SELECTOR PW4192

UA02A CONTROL BOARD
PW4298-1

SA05 SEARCH
SA03 MFT. UP
SA01 POS. UP
SA06 MEMORY
SA04 MFT. DN
SA02 POS. DN
SA07 ON/OFF

TO PINS OF P513 ON MAIN BOARD
R649 P2.7K
R654 10K(B) BASS
R653 10K(B) TREBLE
R651 50K(B) VOL
GND
+12V
R561 4.7K
R215 P8.2K
R555 10K(B) COLOUR
R256 10K(B) CONTRAST
R257 500(C) BRIGHTNESS
TO PINS OF P550 ON MAIN BOARD

AERIAL TERMINAL
P501

UP01 I.R. AMP BOARD PW4170
MR01 PR01
RMT
+5V
ICK01 µPC 1474 HA
LK01 TRF3055
CK01 0.0022
CK07 0.0022
LK02 TRF3055
CK02 0.068
RK02 P10K
RK03 P22
CK03 10µ (16V)
CK04 33µ (16V)
DK01 SFH205
CK05 10µ (16V)
RK04 P2.2K
CK06 10µ (16V)
RK01 P22K

H001 UHF TUNER TYPE 204
(UHF)(+B)(AGC)(VT)(+B) (IF)
DA14 IN4148
D644 IN4148
CA07 47µ (16V)
QA02 BC557A
QA52 BC557A
R609 P3.3K
R616 1K
R617 P6.8K
R618 P15K
R619 P10K
R109 P220K
SOLDER LINK
DA05 µPC574JC
DA06 IN4148
CA02 0.01
CA01 1µF (50V)
CB11 0.01
CB03 0.1 (63V)
RB02 P470
RB06 P470
RB04 P470
RB07 P15
CB06 0.01
CB07 3.3µF (16V)
CB10 1000
LB01 1µH
CB04 39
CB05 18 (CH)
CB08 0.01
CB09 330
QB01 BF324
+12V
C105 4.7µF (35V)
C102 22µF (50V)
RB89 P430K
+112V
RF AGC
+12V
L602 TRF6702G
L601 PL-12
C602 3
C601 47
R612 P470
R611 P3.3K
Q611 BC557A
SOU LIN
C617 62 (CH)
Z601 6MHz
L171 TRF1445
C174 15
C175 2
C176 2
R603 P10K
R602 P2.2K
C111 2200
L106 AZ9246E
R202 P1.5K
R604 P100K
C604 4700
C603 0.01
C109 0.01
L103 TRF1445
C107 10µF (50V)
C108 P3.3K
IC101 TA7680AP PIF/SIF/AFT
LIMITTER AMP
FM DET
ATT
SIF AMP
POWER REGU
VIDEO AMP
VIDEO DET
AFT DET
IF AMP
IF AGC
Z101 PSF F1035B
L162 TRF9221
L102 TRF1453
C101 1000
C115 1000
R101 P1K
RR64 P1.2K
RR65 100K
QR62 BC557B
TO PIN 17 IC620
RR66 2.2K
CR61 10µF (50V)
CR62 0.01
L161 TRF1019
RR67 2.2K
TO PIN 1 OF IC620
C162 0.01
R163 P5.6K
C161 1000
R161 P180
R162 P1K
Q161 BF199
R164 P220
R165 P680
C163 1000
R166 P27
RR75 P4.7K
RR76 P2.7K COL
DR71 IN4148
RR73 P12K
RR74 P47K
QR72 BC557A
CR71 3.3µF (50V)
CR72 0.01
QR71 BC547A
RR43 P12K
RR44 P47K
QR41 BC547A
DR41 IN4148
RR45 P4.7
RR46 P56K BRT
QR42 BC557A
CR41 3.3µF (50V)
CR42 0.01
R614 P1K
R605 P3K
C606 1µF (50V)
C106 2.2µF (50V)
R107 P820K
R181 5K(B)
AGC DELAY
TP-14
TO (65) OF P516
C608 3.3µF (50V)
R606 4.7K
C609 3.3µ (50V)
R820 S110K
R818 P1K
0.02
Q803 BC547A
CS03 10µ (35V)
RS01 R510
QS01 BDT31A
DS09 BZX79B12
RS02 P1.8K
CS01 470µF (35V)
DS04 DS03 DS02 DS01
DS01~DS04 IN4002x4
QS02 BD202
RS01 R5.6
DS08 DS07 DS06 DS05
DS05~DS08 IN4002x4
CS04 10µ (35V)
QS04 BC557A
RS07 P1K
DS10 BZX79B5V1
CS07 47µ (16V)
QS03 BC547A
CS02 1000µ (25V)
ATPW1282 RMT. POWER TRANS.
R821 S1K
R801 IR5.2 S9.2
D801~D804 TVR4Jx4
C803~C806 4700 x 4 (AC250V)
T801 TRF3110
AC 240V
SF801 ΔT2A
C801 0.1 (AC250V)
ΔS901 MAINS SW
M580
P580
ΔL801
ΔL902
R890 PTH
ΔL901 ΔL903
DEGAUSS COIL TYPE 943BØE x2
M590
P590

NOTES:

1. This circuit diagram is subject to change without notice.

EXPRESSION

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

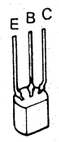
1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.

GROUNDING SYMBOL

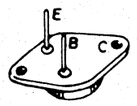
1. ⊥: Non isolated ground, ⏚ : Isolated ground.

TERMINAL VIEW OF TRANSISTOR

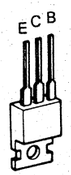
① BC327
BC547A
BC557A
BF324



② 2SD820
2SD870

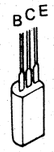


③ 2SC2073



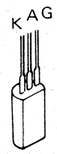
④ 2SC2068
BF871

⑤ 2SA966
2SC2482



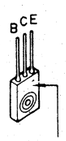
⑥ 2SK30ATM

⑦ SFOR1B41



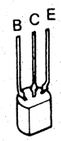
(SCR)

⑧ BD233-16



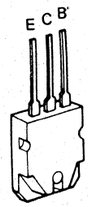
Type name printed

⑨ 2SC1959

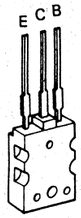


⑩ BF199

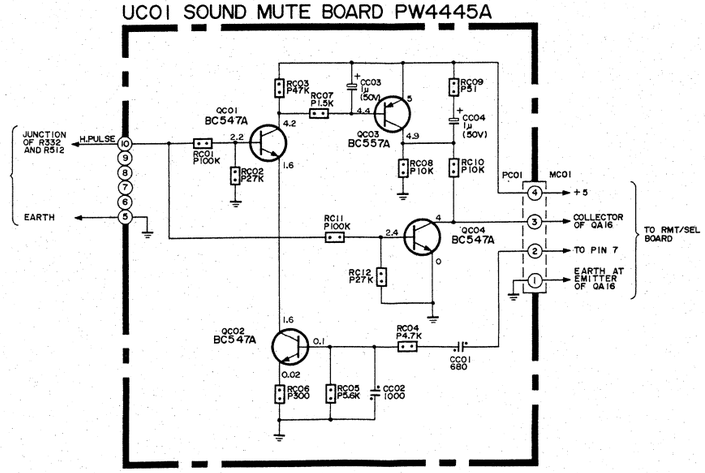
⑪ 2SD716
2SB686



⑫ 2SD1427



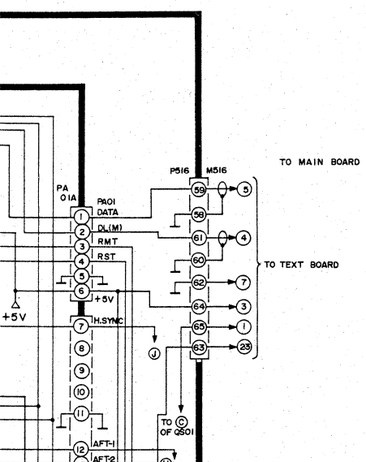
UC01 SOUND MUTE BOARD PW4445A



MODIFICATION NOTE:

The following modifications are made for the improvement of ICA11.
Check the type name of ICA11 when servicing.

	Before Modification	After Modification
ICA11	IC TMP47C432N-8867	IC TMP47C432N-8884
UC01	Sound Mute Board, PW4445A	None
QA16	None	Transistor, BC547A
CA21	None	CD, 680pF, 50V
CA22	None	CD, 1500pF, 50V
RA64	None	CF, 4700ohm, 1/6W
RA65	None	CF, 5600ohm, 1/6W
RA66	None	CF, 10K ohm, 1/6W



U902A MAIN BOARD PW4325-1

FROM CONTROL BOARD

M351

P351

IC620 TDA1524A SOUND CONTROL

TREBLE

VOL VCC BASS

TO RR66

TO RR67

PA03A PA03

ISOLATED PART

+13.5V

+12V

IC621 TDA 1015 AUDIO OUT.

POWER AMP

PRE AMP.

Q604 BC547A

D641 ZPD9.1

P560

P661 HEAD PHONE JACK

W662 TWEETER

M560

UA02 HEADPHONE BOARD PW4298-3

TO TEXT BOARD

FROM TEXT BOARD

128Vp-p(H)

Q505 BF871 RED OUT.

Q591 IN4148

Q508 2SC2482

RED CUTOFF R557 10K (B)

Q502 BF871 GRN OUT.

Q592 IN4148

Q510 2SC2482

GRN CUTOFF R558 10K (B)

Q509 BF871 BLU OUT

Q593 IN4148

BLU CUTOFF R559 10K (B)

CRT SOCKET

V901 PICTURE TUBE 660DY TC03(PDY)

H.V

116Vp-p(H)

106Vp-p(H)

+112V

+12V

0.7Vp-p(H)

0.9Vp-p(H)

0.4Vp-p(H)

IC501 TA7699AP VIDEO/CHROMA/DEF

IH AMP ADJ.

BURST PHASE ADJ

IH DL DL701

IH DL PHASE ADJ.

COLOUR SYNC ADJ.

ACC AMP

GAIN CONTROL

BURST GATE

K/I DET

V C C

F F

APC DET

DEMOD

AMP

INVERTER

SYNC. SER

PHASE DET.

H. OSC

H. DRIVE

X-RAY

VERT. OSC

V. AMP

V. DRIVE

Y-AMP

0.75Vp-p(H)

4Vp-p(H)

5.6Vp-p(H)

2.6Vp-p(H)

3.6Vp-p(H)

2.4Vp-p(H/2)

2.1Vp-p(H)

0.15Vp-p(H)

1.6Vp-p(H)

2.7Vp-p(H)

1.8Vp-p(H)

3.5Vp-p(H)

2Vp-p(V)

0.9V

HEIGHT

Q0204 IN4148

Q0202 IN4148

Q0203 IN4148

Q0201 BC547A

Q0302 BC557A

Q0244 IN4148

Q0242 IN4148

D0243 ISS104

Q0241 IN4148

SUB BRIGHT

FROM CONTROL BOARD

+ 180V

GROUND

HEATER

FOCUS

SCREEN

VIDEO DET

AFT DET

AFT OUT

NOISE INVERTER

IF AMP

IF AGC

DELEYED AGC

AGC DELAY

TP-14

TP-15

Q611 BC557A

L171 TRF1445

AFC BALANCE

Z601 6 MHz

IC101 TRF1445

L105 PL-5.6

L601 PL-12

SOLDER LINK

Q802 2SC2383-Y or 2SC2383-O

Q803 BC547A

Q371 BC547B

Q372 BC547B

D371 BZX79B5V6

TO AUDIO

+13.5V

C830 470μF (25V)

C835 4700 (AC400V)

D830 BVY59C

D801~D804 TVR4Jx4

C803~C806 4700 x 4 (AC250V)

C810 120μF (400V)

C811 10μF(800V)

C812 33μF (160V)

C813 1000 (2KV)

D807 RG-2

D808 BYV95C

D809 BYV95C

STR-5412Δ CONVERTER OUTPUT

SWITCHING REGULATOR

DRIVE

SET

TPW2000 CONVERTER TRANS.

IC303 TDA3651A VERTICAL OUT.

DRIVER

OUTPUT STAGE

VOLTAGE SOURCE

FLYBACK GENERATOR

+27.2V

19V(H)

2.9Vp-p(V)

40Vp-p(V)

D305 BYV95C

D309 IN4003

L411 TLN2056

DEFLECTION COIL

HOR. COIL

VER. COIL

Q402 2SC2482 (FA-I) HORIZ. DRIVE

T401 TLN1023Δ HORIZ. DRIVE TRANS.

Q404 2SD1427 HORIZ. OUT

T461 TFB4023A0 HORIZ. OUT. TRANS

E.H.T

D406 BYV95C

D408 BYV95C

D302 BYV95C

120Vp-p(H)

0.7Vp-p(H)

10Vp-p(H)

1080Vp-p(H)

HORIZ.HOLD

VERT.HOLD